RESEARCH IN PROGRESS

A record of subjects taken up for research by scholars
registered for doctoral degrees with the Indian
universities during 1958 - 66

Vol. 1 PHYSICAL SCIENCES

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PREFACE

In August 1965 the Board decided to resume publication of its two projects 'Bibliography of Theses Accepted' and 'Research in Progress' which had not been kept up since 1958. While doing so the Board also decided to amend as well as enlarge the scope of both the projects as follows.

One was to bring out a consolidated list of theses, subjectwise, in respect of doctoral degrees conferred by Indian universities since 1857, the year in which the Presidency universities were established. Some information was already available in the Board office but a good deal more had to be collected. As a result of prolonged correspondence with the universities complete data has been collected now and it is in the process of being catalogued and classified. Something like 15,000 entries have been received and it is hoped that beginning with 1969 volumes dealing with the various university disciplines would start appearing one by one. If the present plans do not receive any unexpected setback the whole project should be completed by 1972.

The second project related to the collection of information about 'Research in Progress'. The period from 1958 to 1966 was taken as the base period and wherever it was reported that research on a particular topic was still in progress the same was included. This volume deals only with the physical sciences. Volumes dealing with biological sciences, social sciences and humanities would follow within the next one year.

The information provided in this and the subsequent volumes is complete only to the extent that the universities could be persuaded to make it available. This is only another way of saying that the information provided here covers about two/thirds of those enrolled for their doctoral degrees. All kinds of difficulties were encountered with regard to the collection of data and it is not necessary to go into details here. It is enough to say that the publication of these few volumes from which information about certain universities is missing would have, in future years, a persuasive effect on those who did not respond to our request this time.

It seems appropriate to draw attention to two salient features of the compilation 'a resume of the topic of research' and 'the reference note'. Under resume, a brief note giving the progress made so far as also the possible conclusions proposed to be arrived at are indicated. Not all scholars have supplied these resumes but in most cases they have done so. These were prepared by the scholars themselves and have been duly authenticated by their guides. Since the instructions given in this regard were not complied with in all cases it became necessary to edit them. Something like two/thirds of them have had to be edited in consequence. The editorial changes however do not affect the accuracy of the statements, responsibility for which rests exclusively with the research scholars and their guides.

The reference note added after the resume lists all the papers published by the scholar that have a bearing on his research topic. It is hoped that this note too would be found useful.

I must place on record my appreciation of the able and dedicated work done by our Librarian, Shri Sutinder Singh and his staff in the preparation of these volumes.

Amrik Singh
Secretary
Inter-University Board of
India & Ceylon

New Delhi,
August 6, 1968.

INTRODUCTION

It all started with a suggestion that Sir Richard Gregory, then Editor of 'Nature', made to the Govt. of India during his visit to the country in 1933. He recommended that a list of scientific theses which are written for the various Indian university degrees should be published by the Government to make them available to the scientific world. Since the matter concerned the Universities in India, the Govt. of India in their Department of Education, Health and Lands thought it fit to request the Inter-University Board to consider the desirability of preparing and publishing a bibliography of all the original work done in India on the science as well as on the arts side. The Board at its 9th Annual Meeting held at Delhi in March, 1934 accepted the suggestion and in pursuance of it brought out the first bibliography in 1935. In 1944, however, the scope of these bibliographies was extended to cover the research in progress also and it was precisely in this year that the first 'List of Subjects in Arts and Sciences in which Research work is being done in different Universities and Research Institutions' was brought out. The two series ran parallel to each other till 1958. But then for about a decade there was no publication. It was in 1965 that the Board decided to revive these publications. But now it was done with a difference. To bridge the gap in information before 1930 as also after 1958 and to make available a consolidated record of all the research done in the Indian Universities so far, the Board launched the project, 'Bibliography of Theses Accepted' whereby it envisaged issuing subjectwise consolidated lists of Doctoral Theses Accepted by Indian Universities. While with regard to 'Research in Progress', it was decided that the first issue should cover the period 1958 to 1966, it was eventually visualised as an annual feature.

The present volume covering Physical Sciences is the first to be issued under the second project i. e. 'Research in Progress'. It lists 1,947 entries. These have been classified by the Dewey Decimal Classification (17th Edition) and this governs their general arrangement. The main subject, say Mathematics, is given at the top in capital letters in the centre of the page. The major divisions of subjects, for instance Algebra, Geometry etc., in case of Mathematics, are again given in the centre of the page but in upper and lower case letters. Subordinate groups of these divisions, like Integral Calculus and Differential Calculus in case of Calculus, are indicated on the left hand side of the page in upper and lower case letters in bold type. Further subdivisions of these groups, such as, Orthogonal Expansions and Integral Equations in case of Integral Calculus, are also given on the left hand side in italics. Under these subject headings, the arrangement of entries is, however, alphabetical according to the Surnames of the Scholars. This has primarily been done to facilitate search by the Research Scholars who are expected to be the major users of this bibliography.

Each entry includes detailed particulars about the scholar in the following order : Serial number, Name of the scholar, Title of thesis (as registered with the University), Name of the university, Department/Institute where research is being conducted, the years when research was begun and is likely to be finished, Name and designation of the guide, Brief resume of the research topic and the Reference Note. Unless otherwise stated immediately after the title of the thesis, the degree for which research is being conducted is taken as Ph.D and as such all the entries do not make a mention of this fact.

The serial number consists of two parts. The first is the serial number that runs throughout the length of the publication and is indicative of the total number of entries listed, while the second indicates the serial number of the entries within a particular subject. Thus it should be possible to ascertain as to how many entries are there in a particular subject, say Mathematics, Physics or Chemistry, out of the total number of entries listed. This, we believe, will spotlight the neglected areas of research. While rendering the names of the scholars, the surname has been taken first and is followed by the forename. Abbreviations have been used to render the names of the various universities/institutes. A complete list of these abbreviations along with their expansions is given in the beginning of the compilation. As regards the guides under whom research is being conducted, information has been provided in the majority of the cases. The word 'independently' has been used to denote cases where the scholars have been exempted from conducting research under a guide. But in cases where no such information was available the letters 'n.g.' (No guide) have been used to say that the information about the guide is not available. The designation given after the name of the guide has reference to the department of the university in which the research is being conducted. In cases where the guide does not belong to this department of the university, complete address has been given to facilitate exchange of information. In a few cases, however, where the information about the designation of the guide was not forthcoming, we had to be content with the name of the guide only. The brief resume included in each entry is a statement of the progress made so far. It also points to the possible conclusions that are likely to be arrived at. The Reference Note lists all the papers published by the scholars that have a bearing on the topic of research. The information included in the Reference Note is given in the following order : Title of the paper, if supplied, joint authors, if any, name of the periodical, volume and issue number, the year and inclusive pagination. The names of the periodicals have also been abbreviated and these abbreviations along with their expansions are listed after the abbreviations for universities/institutes. The brief resume together with the Reference Note will, we hope, be found useful by the users of this bibliography and will elucidate the perspective in which a particular piece of research is being carried out.

The index of scholars also calls for a word of explanation. It is arranged alphabetically according to the Surnames of the scholars. But a significant departure from strict alphabetization consists in grouping together the Surnames pronounced alike. For instance, under Chaudhary are listed all the variants, like Chaudhuri, Chaudhry, Choudhary, Chowdry etc. These are arranged in the alphabetical order of their initials. The index directs the user to the Subject Part with the help of the running serial number of entries. An alphabetic subject index has also been included to facilitate reference.

It has been our endeavour to arrive at the maximum degree of specificity of subject to the extent it was possible with the Dewey Decima Classification. In actual proctice, however, a very thorough use has been made of the fascicules of the Universal Decimal Classification, wherever available, and in their absence the 8th Abridged Edition of the Universal Decimal Classification has been used extensively for the identification of various topics. This was necessary because the subject matter of our projects comprised highly specialised aspects of various disciplines which did not figure in the schedules of Dewey Decimal Classification. After identification these were then related to the concepts available in the Dewey Decimal Classification for after all Universal Decimal Classification is but an extension of the Dewey Decimal Classification. The classification number has also been given at the bottom of each entry on the extreme right hand side. May be some colleagues in the profession find it useful.

I shall be ungrateful if I do not record the deep debt of gratitude that I owe to the Secretary. He has always been exceedingly generous. But for the keen interest he evinced in these projects and the personal pains he took in the inflow of information from the universities, the coverage would have been far short of what it is now.

Credit for a difficult job well done and thanks for their painstaking and successful efforts go to my colleagues in the I. U. B. Library. Their unflinching co-operation has indeed been a source of great strength in moments of despair which every project of this magnitude entails. Special mention must, however, be made of the invaluable assistance I received from my Senior Professional Assistant, Miss Kanwal Ashta. She displayed exemplary devotion to duty and it is for her that I add my word of special thanks.

I must also express my grateful thanks to the universities/institutes for making this valuable information available to the Board. This catalogue of research in progress, we hope, will help check the research in parallels and promote that in series.

Any suggestions for the improvement of the subsequent issues of the bibliography will be gratefully received.

SUTINDER SINGH

Inter-University Board
of India & Ceylon,
New Delhi,
August 6, 1968.

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ABBREVIATIONS USED

A. Universities/Institutes

Agra	Agra University
Aligarh	Aligarh Muslim University
Allahabad	University of Allahabad
Annamalai	Annamalai University
B.I.T.S., Pilani	Birla Institute of Technology & Science, Pilani.
Banaras	Banaras Hindu University
Bangalore	Bangalore University
Baroda	M. S. University of Baroda
Bhagalpur	Bhagalpur University
Bombay	University of Bombay
Burdwan	University of Burdwan
Calcutta	University of Calcutta
Delhi	University of Delhi
Gauhati	Gauhati University
Gorakhpur	University of Gorakhpur
Gujarat	Gujarat University
I. A. R. I., Delhi	Indian Agricultural Research Institute, Delhi
I. I. S., Bangalore	Indian Institute of Science, Bangalore
I. I. T., Bombay	Indian Institute of Technology, Bombay
I. I. T., Delhi	Indian Institute of Technology, Delhi
I. I. T., Kanpur	Indian Institute of Technology, Kanpur
I. I. T., Kharagpur	Indian Institute of Technology, Kharagpur
I. I. T., Madras	Indian Institute of Technology, Madras
Indore	University of Indore
Jabalpur	University of Jabalpur
Jadavpur	Jadavpur University
Jammu & Kashmir	University of Jammu & Kashmir
Jiwaji	Jiwaji University
Jodhpur	University of Jodhpur
Karnatak	Karnatak University
Kerala	University of Kerala
Kurukshetra	Kurukshetra University

Madras	University of Madras
Madurai	Madurai University
Magadh	Magadh University
Marathwada	Marathwada University
Mysore	University of Mysore
Nagpur	Nagpur University
North Bengal	University of North Bengal
Osmania	Osmania University
Panjab	Panjab University
Patel	Sardar Patel University
Patna	Patna University
Poona	University of Poona
Punjabi	Punjabi University
Rajasthan	University of Rajasthan
Ravishankar	Ravishankar University
Roorkee	University of Roorkee
Udaipur	University of Udaipur
Utkal	Utkal University
Venkateswara	Sri Venkateswara University
Vikram	Vikram University

B. Periodicals

A. I. Ch. E. Jour.	Journal of the American Institute of Chemical Engineers, New York.
Acta Crys.	Acta Crystallographica.
Acta Met.	Acta Metallurgica.
Amer. Math. Mon.	American Mathematical Monthly.
Anal. Chem.	Analytical Chemistry.
Anal. Chim. Acta.	Analytica Chimica Acta.
Ann. Inst. Henri Poincare.	Institut Henri Poincare, Paris. Annales.
Ann. Physik.	Annalen der Physik.
Ann. Soc. Sci. Bru.	Societe Scientifique de Bruxelles, Annales.
ASR.	Applied Scientific Research.
Aust. Jour. Chem.	Australian Journal of Chemistry.
Brit. JAP.	British Journal of Applied Physics.
Bull. Acad. Polon. Sci.	Academie Polonaise des Sciences, Bulletin.
Bull. AMS.	Bulletin of the American Meteorological Society, Boston.
Bull. Chem. Soc. Japan.	Bulletin of the Chemical Society of Japan, Tokyo.

Bull. Geo. Soc. India.	Bulletin of the Geological Society of India, Bangalore.
Bull. N.G.R.I.	Bulletin of the National Geophysical Research Institute, Hyderabad.
Bull. Roy. Acad. Belgium.	Bulletin, Academie Royale de Belgique, Brussels.
C. R. Acad. Sci.	Academie des Sciences. Comptes Rendus Hebdomadaires des Seances, Paris.
Can. Jour. Chem.	Canadian Journal of Chemistry.
Can. Mint.	Canadian Mineralogist.
Chem. Ber.	Chemische Berichte.
Chem. Engg.	Chemical Engineering.
Chem. Engg. Sci.	Chemical Engineering Science.
Chk. Jour. Phys.	Czechoslovak Journal of Physics.
Curr. Sci.	Current Science.
Def. Sci. Jour.	Defence Science Journal.
Elec. Let.	Electronics Letters.
Gauhati Uni. Jour.	Gauhati University Journal.
IJPAP.	Indian Journal of Pure and Applied Physics.
Ind. Builder.	Indian Builder.
Ind. Jour. Chem.	Indian Journal of Chemistry.
Ind. Jour. Mech. Math.	Indian Journal of Mechanics & Mathematics.
Ind. Jour. Met. Geophys.	Indian Journal of Meteorology & Geophysics.
Ind. Jour. Phys.	Indian Journal of Physics.
Ind. Jour. Tech.	Indian Journal of Technology.
Ind. Jour. Theo. Phys.	Indian Journal of Theoretical Physics.
Ind. Mint.	Indian Mineralogist.
JAM.	Journal of Applied Mechanics.
JIGSA.	Journal of Indian Geo-Science Association.
JIGU.	Journal of Indian Geophysical Union.
JIMS.	Journal of Indian Mathematical Society, Delhi.
JINC.	Journal of Inorganic and Nuclear Chemistry.
JISA.	Journal of the Instrument Society of America, New York.
JITE.	Journal of Industrial Teacher Education.
Jour. Acoust. Soc. America.	Journal of Acoustical Society of America, New York.
Jour. Anal. Chem.	Journal of Analytical Chemistry.

Jour. Annamalai Uni.	Journal of the Annamalai University.
Jour. App. Sci. Res.	Journal of Applied Scientific Research.
Jour. Atmos. Terr. Phys.	Journal of Atmospheric and Terrestrial Physics.
Jour. Aus. Math. Soc.	Journal of Australian Mathematical Society, Australia.
Jour. Chem. Engg. Data.	Journal of Chemical and Engineering Data.
Jour. Chem. Phys.	Journal of Chemical Physics.
Jour. Chem. Soc.	Journal of Chemical Society, London.
Jour. Col. Sci.	Journal of Colloid Science.
Jour Fran. Inst.	Journal of Franklin Institute, Philadelphia.
Jour. Geophys. Res.	Journal of Geophysical Research.
Jour. IIS.	Journal of the Indian Institute of Science, Bangalore.
Jour. Ind. Chem. Soc.	Journal of the Indian Chemical Society, Calcutta.
Jour. Ind. Nat. Soc. Soil Mech.	Journal of the Indian National Society of Soil Mechanics.
Jour. Inst. Heat. Vent. Engs.	Journal of the Institution of Heating and Ventilating Engineers, London.
Jour. Inst. Telecom. Engs.	Journal of the Institution of Telecommunication Engineers, New Delhi.
Jour. Karnatak Uni.	Journal of the Karnatak University.
Jour. Less Com. Met.	Journal of the Less-Common Metals.
Jour. Math. Mech.	Journal of Mathematics and Mechanics.
Jour. Mol. Spec.	Journal of Molecular Spectroscopy.
Jour. Org. Chem.	Journal of Organic Chemistry.
Jour. Organometal. Chem.	Journal of Organometallic Chemistry.
Jour. & Proc. Inst. Chemists.	Journal and Proceedings of the Institution of Chemists, Calcutta.
Jour. Phys. Soc. Japan.	Journal of the Physical Society of Japan, Tokyo.
Jour. Pol. Soc.	Journal of Polarographic Society, Surrey.
Jour. Sci. Engg. Res.	Journal of Science and Engineering Research.
Jour. Sci. Engg. Res., I.I.T. Kharagpur.	Journal of Science and Engineering Research, Indian Institute of Technology, Kharagpur.
Jour. Sci. Ind. Res.	Journal of Scientific and Industrial Research.
Jour. Sci. Instr.	Journal of Scientific Instruments.
Labdev Jour. Sci. Tech.	Labdev Journal of Science and Technology.
Math. Jap.	Mathematica Japonica.

Maths. Seminar.	Mathematische Seminar Der Universitat Hamburg.
Met. Min. Rev.	Metals and Mineral Review.
Mikro. Chim. Acta.	Mikrochimica et Ichnoanalytica Acta.
Min. Met. Fuels.	Mines, Metals and Fuels.
Mol. Crys.	Molecular Crystals.
NIM.	Nuclear Instruments and Methods.
Nucl. Phys.	Nuclear Physics.
Oper. Res.	Operations Research.
PAGEOPH.	Pure and Applied Geophysics.
Per. Ess. Oil Rec.	Perfumery and Essential Oil Record.
Phys. Stat. Sol.	Physica Status Solidi.
Proc. AMS.	Proceedings of the American Mathematical Society, Providence.
Proc. CPS.	Proceedings of the Cambridge Philosophical Society, London.
Proc. IAS.	Proceedings of the Indian Academy of Science, Bangalore.
Proc. IEE.	Proceedings of the Institution of Electrical Engineers, London.
Proc. NIS.	Proceedings of the National Institute of Sciences of India, New Delhi.
Proc. Phys. Soc	Proceedings of the Physical Society, London.
Proc. RAS. Belgium.	Proceedings of the Royal Academy of Science, Brussels.
Prog. Theo. Phys.	Progress of Theoretical Physics.
Rev. Roum. des Sci. Tech. Mech. App.	Revue Roumaine des Sciences Techniques, Serie de Mecanique Appliquee.
Roorkee Uni. Res. Jour.	Roorkee University Research Journal.
Sep. Sci.	Separation Science.
Tet. Let.	Tetrahedron Letters.
Trans. ASME.	Transactions of the American Society of Mechanical Engineers.
Trans. Faraday Soc.	Transactions of the Faraday Society, Aberdeen.
Trans. ICS.	Transactions of the Indian Ceramics Society.
Trans. IEEE.	Transactions of the Institute of Electrical and Electronics Engineers, New York.
Z. Anal. Chem.	Fresenius' Zeitschrift fur Analytische Chemie, Labor-Und Betriebsverfahren.

Z. Anorg. Allgem. Chem.	Zeitschrift für anorganische und allgemeine Chemie.
Z. Fur. Kris.	Zeitschrift für Kristallographie.
Z. Phys. Chem.	Zeitschrift für physikalische Chemie.
ZAMP.	Zeitschrift für angewandte Mathematik und Physik.

MATHEMATICS

Algebra

Permutations & Combinations

1.1 Tyagi, Mahendra Singh. Combinatorial mathematics. I.I.T., Kanpur, Mathematics, 1965-68. Kapur, Jagat Narain, Professor and Head of the Department.

It is proposed to investigate some new methods of combinatorial mathematics for solving problems which are faced by any part of the society and attempt their formulation as the graph theoretic problems.

512.5

Abstract Algebra

2.2 Bajaj, M. N. Structure of algebra. Delhi, Mathematics, 1965-68. Bhattacharya, P. B., Reader.

512.8

3.3 Kosti, Madhukar Ekanath. Some problems in abstract algebra. Bombay, Institute of Science, 1964-69. Huzurbazar, M.S., Professor and Head of the Department.

512.8

4.4 Nagarkatte, Balkrishnarao Seetharamarao. Some problems in abstract algebra. Bombay, Institute of Science, 1964-69. Huzurbazar, M. S., Professor and Head of the Department.

512.8

5.5 Nageswara Rao, N. Mathematics, arithmetic junctions and their bearing on modern abstract algebra. Delhi, Mathematics, 1962-67. Bhattacharya, P.B., Reader.

512.8

6.6 Prahlad Singh. Theory of sets and some abstract mathematical structures. Magadh, Mathematics, 1963-67. n.g.

512.8

7.7 Saha, Fullara. Modern algebra. Delhi, Mathematics, 1965-68. Jain, S. K., Reader.

512.8

8.8 Sharma, Pramila. Modern algebra. Delhi, Mathematics, 1965-68. Jain, S. K., Reader.

512.8

9.9 Srivastava, Jang Bahadur. Abstract algebra. I.I.T., Kanpur, Mathematics, 1964-67. Sinha, Indra Nand, Asstt. Professor.

512.8

10.10 Vijay Bala. Modern algebra. Delhi, Mathematics, 1964-67. Bhattacharya, P. B., Reader.

512.8

11.11 Wats, B. S. Modern algebra. Delhi, Mathematics, 1964-67. Bhattacharya, P. B., Reader.

512.8

Theory of Numbers

12.12 Balasubramanyam, G. Waring's problem. Venkateswara, Mathematics, 1962-68. Banerjee, D. P., Professor (Retd.).

512.81

13.13 Dasgupta, Maitreyi. Investigations on some problems in theory of sets. Calcutta, Mathematics, 1965-67. Basumajumdar, N. S., Reader.

512.81

14.14 Gupta, R. N. Theory of rings. Delhi, Mathematics, 1965-68. Jain, S. K., Reader.

512.81

15.15 Markanda, Raj Kumar. Global dimensions of rings and algebras. Panjab, Mathematics, 1964-68. Ramanujan, C. P., Professor.

512.81

16.16 Mehrotra, Shri Narayan. Some problems of higher arithmetic. Bhagalpur, Mathematics, 1966-68. Sinha, Tej Narayan, Reader.

It is proposed to study the Tarry-Escott problem and related topics in the theory of numbers.

512.81

17.17 Rameswar Rao, D. Theory of numbers : Diophantine equations. Osmania, Mathematics, 1964-68. Afzal Ahmed, Research Supervisor and Reader.

The study mainly deals with diophantine equations, number theoretic functions, congruences and quadratic residues, and continued fractions. It is also proposed to study prime number theory and algebraic number theory.

512.81

18.18 Sengupta, Sachibhushan. Distance sets and ratio sets and allied problems in theory of sets. Calcutta, Mathematics, 1965-68. Basumajumdar, N. S., Reader.

512.81

19.19 Subrahmanya Sastry, Varanasi Venkateswara. Some problems on partitions with congruence conditions. Venkateswara, Mathematics, 1960-66. Banerjee, D. P., Professor (Retd.).

Exact and asymptotic formulae have been obtained for $P_{A,m}(n)$ and $q_{A,m}(n)$, numbers of partitions of n, respectively into unrestricted and distinct parts$\equiv \pm a^j$ (mod. m), $a_j \in A$, for $A = a, \bar{a}, \tilde{a}, \hat{a}$; $a = \{a_j\}$, $1 \leqslant a_j < \frac{m}{2}$; $\bar{a} = aUm$, $\tilde{a} = aU\frac{m}{2}$ (m even), $\hat{a} = \tilde{a}U\frac{m}{2}$, using analytic procedures.

512.813

20.20 Surjeet Singh. Theory of rings. Delhi, Mathematics, 1963-67. Bhattacharya, P. B., Reader.

512.81

Theory of Groups

21.21 A. Lakshmi. Studies in topological groups and allied structures. Madras, Mathematics, 1962-67. Balachandran, V. K., Professor.

Results have been obtained in topological wreath products and bicohomology theory for a pair of Lie groups and coherent pair of extensions.

Topological wreath products. Jour. Aus. Math. Soc. 5; 1965 : p. 396-400.

512.86

22.22 Das, Phullendu. Topological onosi groups. Calcutta, Pure Mathematics, 1964-67. Chaudhuri, A. C., Reader and Head of the Department.

512.86

23.23 Gopalakrishnan, V. Group theory. Delhi, Mathematics, 1964-67. Bhattacharya, P. B., Reader.

512.86

24.24 Padmanabhan, R. Studies in ordered and algebraic systems. Madurai, Mathematics, 1962-67. Venkataraman, M., Professor and Head of the Department.

Certain problems in the axiomatics of groups and lattices are investigated. The class of lattices, as a member of the family of algebras with two binary operations, has some interesting properties. It is shown, conversely, that these properties are characteristic of lattices, i.e. they identify lattices among other similar algebras. Similar studies are made on groups and other allied algebraic systems. Simplest possible axioms are also given for certain equational classes of groups and lattices.

512.86

25.25 Ravisankar, T. S. Studies in algebra. Madras, Mathematics, 1963-67. Balachandran, V. K., Professor.

Research has been done on some problems connected with normal Lie, Malcev algebras, analytic loops, hoops etc. Attempts are being made at some possible approach to the study of algebras associated with Malcev and extended Lie algebras.

512.86

26.26 Ray, Kamakhya Chandra. Some studies of problems on the measure of a set. Calcutta, Pure Mathematics, 1962-67. Lahiri, B. K., Reader in Mathematics, Kalyani University.

512.86

27.27 Tewari, Udai Bhan. Studies in amenable semigroups. Panjab, Mathematics, 1965-68. Srinivasan, T. P., Professor.

512.86

28.28 Varadarajan, M. Problems in algebra and analysis. Madras, Ramanujan Institute of Mathematics, Madras 1963-67. Rajagopal, C. T., Director, Ramanujan Institute of Mathematics, Madras.

512.86

Theory of Forms

29.29 Mital, Karam Vir. Numerical solution of shallow spherical shells. Roorkee, Mathematics, 1964-66. Chandrika Prasad, Professor.

A numerical method of solving problems of uniformly thin shallow spherical shells with general shape of boundary and boundary conditions is studied. The partial differential equations of the shell are derived from the variational principle in a form so as to yield a real symmetric matrix on discretisation, to which iterative methods can be reliably applied.

512.87

Universal Algebra

30.30 Devapakkiam, C. Viola. Studies in algebra. Madras, Mathematics, 1965-69. Balachandran, V. K., Professor.

512.89

31.31 Jayakumar, A. Vincent. Commutative algebra. Madras, Ramanujan Institute of Mathematics, Madras, 1965-68. Venkataraman, R., Reader, Ramanujan Institute of Mathematics, Madras.

The problem of generalising Ulm's theorem is being considered and various other related ideas are carefully analysed.

512.89

32.32 Jeyamma, Srinivasan. Studies in analysis. Madurai, Mathematics, 1961-67. Venkataraman, M., Professor and Head of the Department.

Studies are being made on various theories of generalized functions and their interrelations. A structure called good space has been defined and its property studied. Every generalized function space is found to be a good space and satisfactory interrelations between the various generalized function spaces have been established.

512.894

33.33 Kahlon, Upkar Singh. Commutative algebra. Panjab, Mathematics, 1964-68. Ramanujan C. P., Professor.

512.89

34.34 Mohd. Badiuzzaman. Infinite matrices and summabilities. Aligarh, Mathematics, 1965-68. Siddiqi, J.A., Professor and Head of the Department.

512.896

35.35 Subramanian, Harihara Iyer. Algebra and analysis: Studies in general Hull-Kernel spaces. Madurai, Mathematics, 1962-67. Venkataraman, Meenakshisundaram, Professor.

A multiplicative lattice is the general set up of an "ideal lattice". The Krull theory of ideals for rings is studied in this general aspect. Also general Hull-Kernel spaces are defined and studied in the general set up of an m-lattice. A particular case of the Hull-Kernel space of maximal l-ideals of an f-ring is also being considered in detail.

512.894

36.36 Venkataraman, K. Studies in algebra and topology. Madras, Mathematics, 1963-67. Balachandran, V. K., Professor.

A theory has been developed of almost periodic functions defined on a group taking values in certain Boolean algebra. Questions, such as, the existence and uniqueness of the mean Bohr compactification etc., have been considered.

512.89

Geometry

Non-Euclidean Geometry

Geometric Topology

37.37 Arya, Asha Rani. Topology. Delhi, Mathematics, 1965-68. Auluck, F. C., Professor, Department of Physics and Trehan, S. K., Reader, Department of Physics.

513.83

38.38 Arya, Shashi Bala. General topology. Delhi, Mathematics, 1964-67. Singhal, M. K., Reader.

513.83

39.39 Buch, V. B. Modern algebra and topology: Studies in ordered topological spaces. Madurai, Mathematics, 1961-67. Venkataraman, M., Professor and Head of the Department.

Ordered topological spaces and, in particular, such spaces where the order is 'continuous' are being studied and characterised. It has been proved that the Jordan Curve theorem is true in the topological product of two copies of such a space, which has been called the 'generalised plane'.

513.83

40.40 Chilana, A. K. Differential topology. Delhi, Mathematics, 1965-68. N. Prakash.

513.83

41.41 Goyal, Usha. Topology. Delhi, Mathematics, 1964-67. Singhal, M. K., Reader.

513.83

42.42 Kar, Mamata. Topology. Delhi, Mathematics, 1964-67. Singhal, M. K., Reader.

513.83

43.43 Popli, R. P. Topology. Delhi, Mathematics, 1965-68. Singhal, M. K., Reader.

513.83

44.44 Sethi, Nirmal. Topology. Delhi, Mathematics, 1965-68. Singhal, M. K., Reader.

513.83

45.45 Sushma Prabha. General topology. Delhi, Mathematics, 1965-68. Singhal, M. K., Reader.

513.83

Riemann Geometry

46.46 Chander Prabha. Riemann geometry. Delhi, Mathematics, 1964-67. N. Prakash.

513.85

47.47 Raychaudhuri, Ahindranath. Some problems in Riemann geometry. Calcutta, Pure Mathematics, 1964-67. Chaki, M. C., Reader.

513.85

48.48 Srivastava, Mahesh Chandra. Studies in Riemann geometry. Banaras, Mathematics, 1965-67. K. P. Singh, Head of the Department.

The research covers the following aspects : Gravitational radiation with the aid of cosmological study, consideration of material energy tensor, and algebraic and differential structure of Riemann tensor; Study of the Cauchy problem and the nature of the rapidly varying field; and consideration of the bounded source of radiation, gravitational significance of the geometrical tensor in a Riemann — four fold groups of motions with reference to various gravitational matrices of different symmetries, and electromagnetic fields with reference to Einstein-Maxwell theory and Rainich theory.

513.85

Co-ordinate Geometry

49.49 Basu, Nirmalkumar. Some problems in finite geometry. Calcutta, Mathematics, 1964-67. Mandan, Sahib Ram, Asstt. Professor, I. I. T., Kharagpur.

516.5

50.50 Jagannathan, T.V.S. Studies in geometry. Madurai, Mathematics, 1964-67. Venkataraman, M., Professor.

Projective planes have been classified according to the configuration formed by the point line pairs (P, 1), for which the plane is (P-1) transitive. The structure of the simplest form of the co-ordinate algebra is determined for each of the above classes and is further shown that each of these classes is non-empty.

516.57

51.51 Patwardhan, Girish Anant. Some applications of projective geometry to combinatorial problems. I. I. T., Bombay, Mathematics, 1964-67. Vartak, M.N., Asstt. Professor.

Generalizations of some partially balanced incomplete block designs of groups, divisible and cubic type, are under investigation. The theory of linear associative algebras already developed by R. C. Bose and D. Mesner, is being extended so as to apply it to more general designs.

516.57

52.52 Sanyal, Arun. Reciprocal tetrahedra with respect to a given tetrahedron. I.I.T., Kharagpur, Mathematics, 1964-67. Mandan, Sahib Ram, Asstt. Professor.

Existence of two types of tetrahedra which are reciprocal with respect to a given tetrahedron as also some general and special properties of two reciprocal tetrahedra are being investigated in detail.

516.55

53.53 Sharma, Chandra Bhal. Circular and elliptic inclusions in elastic medium. I. I. T., Kanpur, Mathematics, 1961-67. Bhargava, Rajeshwar Dayal, Professor.

Circular and elliptic inclusions with a plane harmonic temperature distribution in an infinite elastic medium have been considered. A circular insert in an elastic medium with harmonic temperature distribution has been solved for the first time. Circular inclusions in elastic half plane and infinite elastic-strip have been dealt with for two different cases of straight boundaries :

(a) stress free, and (b) displacement free. Energy considerations of elasto-plastic medium with cylindrical cavity have been viewed and a problem of thick-cylinder (plastic elastic) with external pressure and temperature gradient is being solved.

(1) Elasto-plastic medium containing a cylindrical cavity under uniform internal pressure. (with Rajeshwar Dayal Bhargava). Jour. Fran. Inst. 277 (S) ; May '64: p. 422-427 ; (2) Circular region under plane harmonic temperature distribution. (with Rajeshwar Dayal Bhargava). Bull. Acad. Polon. Sci. 12 (7) ; 1964 ; (3) An elliptic region with plane harmonic temperature distribution with insulated boundary. (with Rajeshwar Dayal Bhargava). ibid. 12 (12) ; 1964 : p. 557-564 ; and (4) An infinite region with plane harmonic temperature distribution with circular insert. Jour. Phys. Soc. Japan. 19(5) ; May '64 : p. 756.

516.5

Differential Geometry

54.54 Agrawal, Pushpa. Differential geometry. Gorakhpur, Mathematics, 1966-68. Lal, K. B., Professor and Head of the Department.

Certain problems in Finsler space are being investigated.

516 7

55.55 Chandra Mani Prasad. Investigations in the geometry of Finsler spaces. Gorakhpur, Mathematics, 1963-67. Lal, K. B., Professor and Head of the Department.

The generalised normal curvature of a congruence and union curvature of a vector field in Finsler subspace have been defined. The generalisation of Gauss-Codazzi equations has also been obtained with the use of intrinsic curvature tensor. Further work on these lines is in progress.

516.7

56.56 Dhawan, Mohini. Differential geometry of complex manifolds. Delhi, Mathematics, 1962-67. N. Prakash.

516.7

57.57 Goel, Gian Chand. Differential geometry of generalised Riemann spaces. Delhi, Mathematics, 1959-67. Ram Behari, Vice-Chancellor (Retd.), Jodhpur University.

516.7

58.58 Goel, Urmil. Differential geometry of global manifolds. Delhi, Mathematics, 1965-68. N. Prakash.

516.7

59.59 Gupta, Pushpa Lata. Differential geometry of complex variables. Delhi, Mathematics, 1965-68. N. Prakash.

516.7

60.60 Indira Rani. Differential geometry. Delhi, Mathematics, 1961-67. Ram Behari, Vice-Chancellor (Retd.), Jodhpur University.

516.7

61.61 Indrani, A. K. Differential geometry. Delhi, Mathematics, 1965-68. N. Prakash.

516.7

62.62 Kapur, Nirmal. Differential geometry of complex manifolds. Delhi, Mathematics, 1962-67. N. Prakash.

516.7

63.63 Khanna, Sudesh. Differential geometry. Delhi, Mathematics, 1963-67. N. Prakash.

516.7

64.64 Mathai, Saramma. Differential geometry. Delhi, Mathematics, 1965-68. N. Prakash.

516.7

65.65 Mathur, Satish Bahadur. Differential geometry of generalised spaces. Delhi, Mathematics, 1960-67. Ram Behari, Vice-Chancellor (Retd.), Jodhpur University.

516.7

66.66 Nisha Rani. Differential geometry. Delhi, Mathematics, 1963-67. N. Prakash.

516.7

67.67 Sharma, Nand Kishore. Differential geometry. Delhi, Mathematics, 1961-67. Singhal, M.K., Reader.

516.7

68.68 Talwar, Kusum Lata. Differential geometry. Delhi, Mathematics, 1963-67. Singhal, M. K., Reader.

516.7

Kinematic Geometry

69.69 Sambasiva Rau, Syamala. Application of geometric methods to dynamics. Venkateswara, Mathematics, 1963-67. Sambasiva Rau, Pabbaraju, Reader and Head of the Department.

The relationships between the curvatures and torsions of the trajectories and lines of force in a resisting medium in a Euclidean-3-space have been obtained for an inertial particle and the same have been generalised in an N-dimensional space for a holonomic scleronomic dynamical system with N-degrees of freedom. A differential geometric technique has been employed in 3-space and a Riemannian-geometric technique has been employed in the configuration-space of dynamical system.

516.8

Calculus

70.70 Hari Niwas. Analysis. Delhi, Mathematics, 1963-67. V. Singh.

517

Differential Calculus

71.71 Mukhopadhyay, Satyanarayan. Certain investigations on Schwars differentiability. Calcutta, Pure Mathematics, 1965-67. Lahiri, B. K., Reader in Mathematics, Kalyani University.

517.2

Integral Calculus

72.72 Debnath, Loknath. On certain integral transforms and their applications. Calcutta, Mathematics, 1957-67. Datta, M., Professor of Mathematics, North Bengal University.

517.3

73.73 Gangopadhyay, Sorakar. Some problems connected with the structure of the theories of integral transforms. Calcutta, Mathematics, 1965-67. Datta, M., Professor of Mathematics, North Bengal University.

517.3

74.74 Goyal, Gopal Krishna. Finite integral transforms. Rajasthan, Mathematics, 1965-68. Sharma, K. C., Reader.

It is proposed to study the finite Henkel transform, Weyl fractional integral transform and Churchill's Legendre polynomial transform in relation to the differential equations that these transforms satisfy. It is also proposed to study the properties of certain special functions with the help of these transforms.

517.3

75.75 Gupta, Suresh Chandra. Integral transform and special function. Rajasthan, Mathematics, 1965-68. Sharma, K.C., Reader.

It is proposed to study the G-function transform, recently defined by Sharma and it is expected that some interesting results about the generalised G-function, very recently defined by R. P. Agarwal and B. L. Sharma, will be obtained.

517.3

76.76 Khanna, Inder Kumar. Special functions of complex analysis. Banaras, Mathematics, 1966-68. Agrawal, B. D., Lecturer.

A polynomial $B_n(x,y)$ of two variables has been defined by means of a generating relation, having 16 well-known polynomials as its particular cases, some of which are: Hermite, Laguerre, Legendre, Jacobi and Genenbauer. Hypergeometric forms, recurrence relations, differential equations and integrals involving $B_n(x,y)$ have been derived. Orthogonality, zeros, asymptotic behaviour, integral representations etc., are still under investigation.

517.3

77.77 Mishra, Babban Prasad. Contributions to strong Riesz and Abel type summability methods of infinite series. Gorakhpur, Mathematics, 1961-66. Gupta, Sulaxana Kumari, Lecturer.

New definitions regarding strong and absolute summabilities based upon the (A,λ) and $(A\lambda)$ methods have been given and many of their properties investigated. Some theorems on multiplication of strongly summable series and theorems concerning strong Riesz summability factors and absolute Cesaro summability factors have also been obtained. A study of some converse theorems of Fourier series is being made.

(1) Maths. Zeitschr. 90; 1965: p. 310-318; (2) Ren. Cir. Mat. Pal. 14(2); 1965; and (3) Proc. AMS; October, 1966.

517.3

78 78 Mishra, Mahendra Shanker. Special functions of complex analysis. Banaras, Mathematics, 1966-68. Agrawal, B. D., Lecturer.

A polynomial $A_n(x,y)$ of two variables has been defined by means of a generating relation having 22 well-known polynomials as its particular cases, some of which are : Hermite, Laguerre, Legendre, Jacobi, Genenbauer and Sister-Celine. Hypergeometric forms, recurrence relations, differential equations and integrals involving $A_n(x,y)$ have been derived. Orthogonality, zeros, asymptotic behaviour, integral representations etc., are still under investigation.

517.3

79.79 Mohammad Badiuzzaman. Some contributions to summability and allied topics. Bhagalpur, Mathematics, 1962-66. Jha, D. K., Reader, Bihar University.

The necessary and sufficient conditions are obtained for absolute summability for sequences and series and in order that T-matrices be absolutely equivalent for all (c,r)-summable, (c,r)-bounded sequences. Interesting results are obtained on consistency, mutual consistency, translativity, stretching of matrices and other allied topics.

517.3

80.80 Panda, Rekha. Special functions of complex analysis. Banaras, Mathematics, 1965-67. Agrawal, B. D., Lecturer.

A polynomial $A_n(x)$ has been defined by means of a generating relation. Hermite, Laguerre, Legendre, Jacobi and Genenbauer polynomials may be obtained as the particular cases of $A_n(x)$ on specialising the parameters. Hypergeometric forms, recurrence relations, differential equations, integrals involving $A_n(x)$ orthogonality, zeros, asymptotic behaviour and integral representations are amongst the properties that have been derived.

517.3

81.81 Saxena, Rajendra Swaroop. A study of certain transforms. Jodhpur, Mathematics, 1963-67. Saxena, Ram Kishore, Lecturer.

The research is concerned with the definition and development of a new integral transform, named as the F-transform. As the transform reduces, in a special case, to the Stieltjes transform, an attempt is made to find out new properties of the latter transform. At the end, certain special infinite integrals are evaluated.

Ann. Soc. Sci. Bru. 79(1); 1965: p. 47-57.

517.3

82.82 Tej Prakash. Complex analysis. Banaras, Mathematics, 1965-67. Brij Mohan, Head of the Department.

Three different generalisations of some of the well-known polynomials like the 'Generalised Bessel' and 'Toscano' have been defined by means of three generating relations. Their hypergeometric representation, recurrence relations and the differential equations have been obtained. Certain other properties like the asymptotic behaviour, zeros, integral representation, orthogonality etc., are still under investigation.

517.3

83.83 Viswanath Iyer, Arnavaram Venkatrama. Absolute summability and its application. Vikram, Holkar Science College, Indore, 1964-68. Pati, T., Head of the Department of Post-Graduate Studies and Research in Mathematics, University of Jabalpur.

517.3

Orthogonal Expansions

84.84 Agrawal, Ramdas. Generalisation of the classical Laplace transform. Vikram, Samarat Ashok Technological Institute, Vidisha, 1966-70. Gupta, P.M., Professor, Samarat Ashok Technological Institute, Vidisha.

517.352

85.85 Agrawal, Sita Ram D. Fourier analysis. Baroda, Mathematics, 1962-66. U. N. Singh, Professor and Head of the Department.

517.355

86.86 Anandani, Parmanand. On the study of H-function and generalised associated Legendre's function. Indore, Mathematics, 1965-67. Saxena, Rajendra Kumar, Reader, G. S. T. Institute, Indore.

Several properties of H-function given by Fox and generalised associated Legendre's function have been studied by using Laplace transform, integration with respect to parameters and fractional integration and differentiation methods. Many interesting and new integrals have been evaluated involving these and other special functions. Some properties of Meijer-Laplace transform are also proposed to be studied.

517.352

87.87 Arunachalam, P. V. Some problems connecting Bessel and Legendre functions. Venkateswara, Mathematics, 1962-69. Banerjee, D. P., Professor (Retd.).

517.35

88.88 Chhabra, Satya Pal. A study of Whittaker transform. Ravishankar, Mathematics, 1964-67. Bhise, Vinayak Madhav, Reader.

The study of the Whittaker transform F (s; k, m) = $s\int_0^\infty (2st)^{-\frac{1}{4}} W_{k,m}(2st)\, f(t)\, dt$ and its relationships with other generalisd Laplace and Hankel transforms will be the main subject matter of the thesis. Summation of series of Meijer's G-function will also be dealt with.

Proc. NAS. 35 (Sec. A, Pt. 2); 1965 : p.165-168.

517.35

89.89 Govind Prasad. Norlund summability of fourier series. Roorkee, Mathematics, 1964-68. Varshney, Om Prakash, Reader.

Application of Norlund summability to fourier series and applied series is being explored.

Roorkee Uni. Res. Jour. 8 (3 & 4); 1965 : p. 15-22.

517.355

90.90 Jain, Nemi Chandra. On Meijer-Laplace transform of two variables. Indore, Mathematics, 1966-68. Saxena, Rajendra Kumar, Reader, G. S. T. Institute, Indore.

It is a study of the theory of Meijer-Laplace transform of two variables involving the kernels in the form of Meijer's G-function. Several properties including the inversion formulae are proposed to be studied. Properties of this transform in relation to self-reciprocal functions in Hankel transform will also be established.

517.352

91.91 Jaiswal, Mata Prasad. Transform calculus. Banaras, Mathematics, 1966-68. Masood, S., Lecturer.

A generalisation of the classical Laplace transform, in which the kernel of transformation is the product of an exponential function and the most general G-function due to Meijer, is under investigation. Using this transform with some known transforms, some generalisations of Stieltjes transform have been deduced.

517.352

92.92 Joshi, Damodar Gopal. A study of fourier kernels with applications. Indore, Mathematics, 1966-69. Bhise, Vinayak Madhav, Reader, G. S. T. Institute, Indore.

The object of research is to investigate general properties of symmetrical as well as unsymmetrical fourier kernels and study their relations with other kernels. The properties will be used to solve problems in applied mathematics from fields like conduction of heat, elasticity etc.

517.355

93.93 Joshi, Rajendra Ratnakar. Fourier analysis on groups. Baroda, Mathematics, 1964-66. U. N. Singh, Professor and Head of the Department.

517.355

94.94 Madan Mohan. Transform calculus. Banaras, Mathematics, 1966-68. Masood, S., Lecturer.

In attempting to correlate the Laplace and Hankel transforms, a generalised transform has been worked out which gives both the aforesaid transforms as particular cases on specializing the parameters involved therein. After deriving an inversion formula for the same, the transform will be subjected to further investigation.

517.352

95.95 Maheshwari, M. L. Theory of transforms with applications. B. I. T. S., Pilani, Mathematics, 1963-67. Mitra, S. C., Research Professor.

The research covers the following aspects : Chain formulae of Laplace transforms, K-transforms and Hankel transforms; extension of certain results of Ramanujan; symbolic correspondence of one and two variables; special functions—Legendre and Bessel functions; relations between various transforms; and integrals of products of Bessel, Legendre and parabolic cylinder functions.

517.35

96.96 Pandya, Vinodray H. Fourier analysis. Patel, Mathematics, 1966-69. Yadav, B. S., Reader.

The study covers the problems on the absolute convergence of Lacunary fourier series.

517.355

97.97 Pathan, Mahmood Ahmed. Laplace transform. Rajasthan, Mathematics, 1965-68. Sharma, K. C., Reader.

Laplace transform and its relation with fractional integral is being studied. Some new and very interesting recurrence relations about Whittaker function and Gauss's hypergeometric function have been obtained which are further used in obtaining the recurrence relations for Fox's H-function.

517.352

98.98 Rattan Singh. Integral transforms and special functions with particular reference to E- and G-functions. Ravishankar, Mathematics, 1966-68. Verma, Chandra Bhushan Lal, Professor and Head of the Department of Mathematics, Science College, Raipur.

517.35

99.99 Shah, Vadilal Maganlal. Some topics of trigonometrical series. Baroda, Mathematics, 1962-67. U.N. Singh, Professor and Head of the Department.

517.355

100.100 Sharma, Umesh Chandra. Generalised Bessel functions of several arguments. B.I.T.S., Pilani, Mathematics, 1964-67. Mitra, S. C., Research Professor.

The research is being done mainly on Wright's generalised Bessel function. This function has been generalised to several arguments in many forms. Many generating functions, recurrence relations and other miscellaneous properties of these functions have been found out and some of their applications deduced.

517.353

101.101 Srinivasan, V. The generalised Meijer transform in one and two variables. Venkateswara, Mathematics, 1961-67. Banerjee, D. P., Professor (Retd.).

The properties of some special functions, such as, Bessel function, hypergeometric functions etc., and the well known integral transforms, such as, Laplace transform and Hankel transform have been studied. Work on the Meijer transform and its generalisations is being done.

Bull. Acad. Polon. Sci. 11 (7); 1963 : p. 431-440.

517.35

102.102 Varma, Ramesh Chandra. Orthogonal functions and polynomials and some applications to Schrödinger equation.

Jabalpur, Applied Mathematics, 1963-66. Bhonsle, Balramji Rao, Professor of Applied Mathematics, Govt. Engg. College, Jabalpur.

The research is being done on the following problems: Generalisation of MacRobert's results involving Legendre polynomials and results due to Wrinch to orthogonal polynomials; integrals connected with Jacobi polynomials; determination of phase shifts in certain cases for the Schrödinger equation; and solution of Schrödinger equation for the potential, $V(r)=\frac{A}{r^3}+\frac{B}{r^2}+\frac{C}{r}$

517.35

103.103 Verma, Raj. Periodic solutions of differential equations. I. I. T., Delhi, Mathematics, 1965-68. Jain, M. K., Professor and Head of the Department.

The study covers Banach limit of fourier series and Banach limit of derived fourier series.

517.355

Integral Equations

104.104 Rusia, Kastur Chand. A study on certain integral equations with applications to problems of engineering. Jabalpur, Applied Mathematics, 1964-66. Bhonsle, Balramji Rao, Professor of Applied Mathematics, Govt. Engg. College, Jabalpur.

Some inversions of integral equations involving most of special functions have been investigated. The solutions of certain dual integral equations arising in electrostatics and elasticity have also have been obtained.

517.37

Differential Equations

105.105 Charlu, Alaham Sathya Narayana. Stability theory in differential equations. Marathwada, Mathematics, 1964-66. Lakshmikantham, V., Professor.

One of the extensions of Lyapunove's second method depends upon the fact that a function satisfying the differential inequalities can be majorised and minimised by the maximal and minimal solutions of the corresponding scalar differential equations. Using the comparison principle, an attempt is made to study the stability of motions of the tube like domains.

517.38

106.106 Dudh Nath Singh. Multigrade equations. Bhagalpur, Mathematics, 1964-66. Sinha, Tej Narayan, Reader.

L. Bastien (1913) and several later writers have considered the system of equations $a_1, a_2, \ldots, a_\triangle \overset{x}{=} b_1, b_2, \ldots,$

$b_{\triangle}$ (x 1, 2,..., k). General and particular solutions are known for certain values of x and k. The object of the research is to study the subject in greater detail.

517.38

107.107 Garde, Ramkrishna Mahadeorao. A study of some ordinary nonlinear differential equations with applications to the problems of electrical engineering. Jabalpur, Applied Mathematics, 1965-67. Bhonsle, Balramji Rao, Professor of Applied Mathematics, Govt. Engg. College, Jabalpur.

The object of the research is to study the nonlinear problems arising in the various fields of engineering particularly electrical engineering, such as, the behaviour of electrical circuits containing nonlinear parameters and other similar problems. The main stress is being laid on proposing easier and new methods for solving such nonlinear problems. The stability aspect is also being studied.

517.382

108.108 Ladde, Gaangaram Shivlingappa. Stability theory of nonlinear differential equations. Marathwada, Mathematics, 1965-67. Lakshmikantham, V., Professor.

It is possible to study the automatic control problem with the help of nonlinear differential equations, containing parameters. Using comparison principle and recent developments, in ordinary differential equations, it is proposed to study stability properties of control systems.

517.382

109.109 Pranesha Rao, P. R. Some topics in the partial differential equations of mathematical physics. I.I.T., Kharagpur, Physics & Meteorology, 1965-68. Bandyopadhyaya, G., Assoc. Professor.

The research covers investigation of a class of nonseparable solutions of the Laplace and Helmholtz equations; study of some functional equations; and determination of the solvable potentials of the radil wave equation.

517.383

110.110 Ramakrishna Rao, D. Differential equations. Karnatak, Mathematics, 1964-67. S. K. Singh, Professor and Head of the Department.

The problems related to ordinary differential equations and boundary values are being studied.

517.382

111.111 Sarkar, Ramatosh. Solution of some differential equations and related topics in field theory. Calcutta, Mathematics, 1958-67. Banerjee, Gangabehari.

517.38

112.112 Shendge, Gopal Rajeshwar Rao. Studies in the theory of differential equations. Marathwada, Mathematics, 1964-66. Lakshmikantham, V., Professor.

Introducing the notion of maximal solution for functional differential equations, certain basic inequalities have been obtained. Using these, it is proposed to study the properties including stability and boundedness of the solutions of functional differential equations and deduce better results in this field.

517.38

Calculus of Variations

113.113 Bhashyam, N. Stochastic duels. Delhi, Mathematics, 1966-69. Verma, R. S., Dean, Faculty of Mathematics and Jaiswal, N. K., Senior Scientific Officer (I), Defence Science Laboratory, Delhi.

Stochastic duels attempt to study combat situations by incorporating microscopic details of a combat. Some investigations have been conducted to study the effect of replenishment of stock, flight-time of round and varying kill probability of the rounds on the outcome of a duel. Further work will be undertaken to study combat operations under different operational situations.

517.4

114.114 Dhiya, R. C. Markov chain and stochastic processes. Delhi, Mathematics, 1964-67. Gupta, H. C., Reader.

517.4

115.115 Kanwar Sen. Stochastic processes. Delhi, Mathematics, 1963-67. Gupta, H. C., Reader.

517.4

116.116 Sabharwal, Yash Pal. Stochastic processes. Delhi, Mathematics, 1962-67. Dhaliwal, R. S.

517.4

Functional Analysis

117.117 Bajpai, Sridhar. A study of Meijer's G-function and Microbert's E-function and their applications. Indore, Mathematics, 1965-67. Bhise, Vinayak Madhav, Reader, G.S.T. Institute, Indore.

Various properties of Meijer's G-function and Microbert's E-function have been studied. Some expansion formulae, finite series as well as integrals have been established. Most of the formulae developed for G-function become key formulae from which a number of results can be developed for hypergeometric, Bessel, Legendre, Whittaker and other related functions.

517.5

118.118 Bandyopadhyay, Chiraranjan. Some contributions to the researches on infinite series. Calcutta, Pure Mathematics, 1962-67. Lahiri, B. K., Reader in Mathematics, Kalyani University.

517.5

119.119 Basappa, Benakanahalli Shivaputrappa. Maximum term and the rank of entire functions. Karnatak, Mathematics, 1963-67. S. K. Singh, Professor and Head of the Department.

517.5

120.120 Chichra, Pran Nath. Theory of functions. Punjabi, Mathematics, 1965-68. Vikramaditya Singh, Professor and Head of the Department.

517.5

121.121 Garg, Mohan Ratan. Functional analysis. B.I.T.S., Pilani, Mathematics, 1966-69. Krishnamurthy, V., Professor.

517.5

122.122 Goel, Ram Murti. Theory of functions. Punjabi, Mathematics, 1964-67. Vikramaditya Singh, Professor and Head of the Department.

The work is being done on univalent functions with special reference to star-like functions.

517.5

123.123 Hajib, S. V. Entire and meromorphic functions. Karnatak, Mathematics, 1964-67. S. K. Singh, Professor and Head of the Department.

517.5

124.124 Kulkarni, Venkatesh Narayana Rao. Exceptional values of entire and meromorphic functions. Karnatak Mathematics, 1963-66. S. K. Singh, Professor and Head of the Department.

The exceptional values of entire and meromorphic functions in the sense of Picard, Borel, Nevanlinna etc., have been studied and their relevance to Nevanlinna defect values is being explored.

517.5

125.125 Mediratta, J. K. Theory of functions. Delhi, Mathematics, 1965-68. Kamthan, P. K.

517.5

126.126 Mishra, V. P. Trigonometric series. Aligarh, Mathematics, 1965-68. Siddiqi, J. A., Professor and Head of the Department.

517.5

127.127 Mustafy, A. K. Expansion of an arbitrary function into an infinite series of various types. Delhi, Mathematics, 1962-67. Gyan Mohan.

517.5

128.128 Parthasarathy, P. R. Functional analysis. Madras, Mathematics, 1963-67. Balachandran, V. K., Professor.

It is proposed to study infinite dimensional Lie algebras particularly L*-algebras—Hilbert Lie algebras, the various analogs of the theorems in the finite dimensional Lie algebras and the representations and the Lie and the Jordan structures in the Banach algebras.

517.5

129.129 Prem Singh. Some aspects of the growth of entire functions and entire Dirichlet series. I.I.T., Kanpur, Mathematics, 1962-67. Srivastava, Ramsaran Lal, Assoc. Professor.

517.5

130.130 Qazi Zameeruddin. Special functions. Delhi, Mathematics, 1962-67. Varma, R. S., Dean, Faculty of Mathematics.

517.5

131.131 Raj Kishor Singh. Functional analysis, Banaras, Mathematics, 1965-67. Sarma, V. L. N., Reader.

A theory of polynomial interpolation has been constructed with the help of Eberlein's countably additive measure on the unit ball of the sequence space 1^1. Particular attention has been paid to the choice of interpolation points and the norm is the r.m.s. norm.

517.5

132.132 Ramachandran, Viswanathan. Functional analysis. Madurai, Mathematics, 1966-69. Venkataraman, Meenakshisundaram, Professor and Head of the Department.

It is proposed to study the nature of structural theory in functional analysis and topological groups.

517.5

133.133 Raman, P. K. Functional analysis and differential equations. B.I.T.S., Pilani, Mathematics, 1965-68. Krishnamurthy, V., Professor.

A project has been taken up to analyse sequential completeness of the strong dual and bidual of a locally convex space and significant results have been obtained.

517.5

134.134 Ram Singh. Univalent functions and conformal mapping. Punjabi, Mathematics, 1964-67. Vikramaditya Singh, Professor and Head of the Department.

517.5

135.135 Reddy, A.R. Problems in the theory of functions. Madras, Ramanujan Institute of Mathematics, Madras, 1963-66. Rajagopal, C. T., Director, Ramanujan Institute of Mathematics, Madras.

The research concerns entire functions represented by (i) power series, and (ii) Dirichlet series. The series (ii) is a generalization of the series (i), with a sequence 1, 2, 3,...in (i) replaced by a sequence $0<\lambda_1<\lambda_2<\ldots\lambda_n\rightarrow\infty$.

The investigation pertains to the least restrictive extra condition, if any, on $\{\lambda_n\}$ required to extend to Dirichlet series, each of a set of standard theorems for power series involving orders, types etc.

517.5

136.136 Seshappa, Dalal Srinivas. On entire and meromorphic functions and entire functions represented by Dirichlet series. Karnatak, Mathematics, 1963-66. S.K. Singh, Professor and Head of the Department.

Maximum tram and the rank of an entire function and various relations between them and the growth of entire functions have been investigated. Different values of entire and meromorphic functions are also being studied.

517.5

137.137 Shah, Gopaldas Vallavdas. Mathematics; Functional analysis. Baroda, Mathematics, 1961-67. U.N. Singh, Professor and Head of the Department.

517.5

138.138 Shahid Husain. Quasi-analytic classes of functions. Aligarh, Mathematics, 1965-68. Siddiqi, J. A., Professor and Head of the Department.

517.5

139.139 Sharma, Om Prakash. On generalised Hankel transforms and self-reciprocal functions. Indore, Mathematics, 1965-67. Saxena, Rajendra Kumar, Reader, G. S. T. Institute, Indore.

Generalised Hankel transforms involving Meijer's G-function and H-function given by Fox have been established. Several properties of these transforms with reference to self-reciprocal functions have been studied. Interesting and useful relations have been derived between various transforms and these have been used in evaluating some finite and infinite integrals. Some properties of Chain-transform are also being developed.

517.5

140.140 Siddiqi, Rafat Nabi. Quasi-analyticity of infinitely differentiable function. Aligarh, Mathematics, 1965-68. Siddiqi, J. A., Professor and Head of the Department.

517.5

141.141 Sribala, S. Functional analysis and linear spaces. Madras, Mathematics, 1963-67. Balachandran, V. K., Professor.

The theory of integrations of functions whose values lie in an ordered group is being studied.

517.5

142.142 Varshney, Ram Gopal. Trigonometric series. Aligarh, Mathematics, 1966-69. n.g.

517.5

143.143 Virendra Singh. Theory of functions. Aligarh, Mathematics, 1966-69. Mazhar, S. N., Lecturer.

517.5

Functions of Real Variables

144.144 Chandrasekhara Rao, Kuripi. Theory of functions of real and complex variables. Annamalai, Mathematics, 1963-67. Ganapathy Iyer, V., Professor.

Work is being done on summability theory and Tauberian theorems.

517.52

145.145 Khan, R. S. Real analysis. Aligarh, Mathematics, 1965-68. Siddiqi, J.A., Professor and Head of the Department.

517.52

146.146 Sheth, Ichhalal Harilal. Real and complex variables. Baroda, Mathematics, 1962-67. U. N. Singh, Professor and Head of the Department.

Several original results pertaining to normal and hyponormal operators in a Hilbert space have been obtained. A typical theorem proved is—If for a hyponormal operator N and an arbitrary operator A, for which O does not belong to the closure of the numerical range of A, AN=N*A, then N is self-adjoint.

517.52

Finite Differences

147.147 Chawla, M. M. On the study of the collocation method with applications. I.I.T., Delhi, Mathematics, 1965-68. Jain, M. K., Professor and Head of the Department.

Work is being done on convergence and error estimation of interpolatory processes, and in particular, the method of interpolation, Gaussian quadratures and cubature formulas.

517.6

Operational Calculus

148.148 Goel, Vishnu Prasad. Operational calculus. B. I. T. S., Pilani, Mathematics, 1966-70. Mainra, V. P., Asstt. Professor.

517.7

149.149 Kulshrestha, Sushil Kumar. Operational calculus. Rajasthan, Mathematics, 1964-67. Sharma, K. C., Reader.

The Laplace transform has been generalised with confluent hypergeometric function as the kernel and is termed as $M_{k,m}$ transform m. Its relation with Varma's Whittaker function transform and certain new recurrence relations and integrals involving hypergeometric function of one or two variables have also been obtained.

517.7

150.150 Mathur, Achal Behari. Some problems in operational calculus of one or two variables analogous to generalised Laplace transform with special application to science and technology. Vikram, Samarat Ashok Technological Institute, Vidisha, 1966-70. Gupta, P. M., Professor, Samarat Ashok Technological Institute, Vidisha.

517.7

151.151 Parashar, Brindhawan Prasad. Operational calculus and generalized functions. Ravishankar, Mathematics, 1965-67. Verma, Chandra Bhushan Lal, Professor and Head of the Department of Mathematics, College of Science, Raipur.

517.7

152.152 Pendse, Asha. A study in operational calculus. Rajasthan, Mathematics, 1966-69. Sharma, K. C., Reader.

It is proposed to study the Kontorovich Lebedev transform and its recent generalisation.

517.7

153.153 Sharma, M. C. Operational calculus and theory of transforms. B.I.T.S., Pilani, Mathematics, 1966-69. Krishnamurthy, V., Professor.

517.7

154.154 Shukla, Durga Prasad. Some problems in operational calculus of one or more than one variable analogous to generalised Laplace transforms. Vikram, Samarat Ashok Technological Institute, Vidisha, 1963-67. Gupta, P.M., Professor, Samarat Ashok Technological Institute, Vidisha.

517.7

Functions of Complex Variables

155.155 Arora, Jawahar Lal. Theory of transforms and its applications. B.I.T.S., Pilani, Mathematics, 1965-67. Mitra, S. C., Research Professor.

It is proposed to study the Laplace transforms, fourier's sine, cosine transforms, Hankel transforms, generalised Hankel transforms, Meijer transforms and Stieltje's transforms. The latter transform has been extensively dealt with. Some new applications of these transforms have also been discussed. Most of the results are believed to be new.

517.8

156.156 Bharatiya, Prem Lal. A study of certain convolution transforms. Jabalpur, Applied Mathematics, 1962-66. Bhonsle, Balramji Rao, Professor of Applied Mathematics, Govt. Engg. College, Jabalpur.

The research covers the study of inversion theorems; evaluation of definite integrals; tables of convolution transforms; mutual relations; convolution transform of two variables; and applications to problems of physics, engineering and other allied branches.

(1) JIMS. 28 (3 & 4); 1964: p. 163-167; (2) Amer. Math. Mon. 72 (4); 1965: p. 393-397; and (3) Math. Jap. 10 (1); 1965: p. 45-48.

517.8

157.157 Chaturvedi, K. K. Study of special functions of one and more variables. Rajasthan, Mathematics, 1967-69. Goyal, A. N., Lecturer.

A new function A*, which is a generalisation of a large number of existing functions, has been defined. It is intended to study this function in all possible aspects regarding expansion in series, derivatives, recurrence relations, the solution of partial differential equation that this function satisfies, the integrals involving this function and its uses in theory of distributions and theory of errors in statistics.

517.8

158.158 Dash, P. C. On functions of complex variables. Delhi, Mathematics, 1965-68. Kamthan, P. K.

517.8

159.159 Gupta, Ram Sarup. Functions of complex variables. Punjabi, Mathematics, 1965-68. Vikramaditya Singh, Professor and Head of the Department.

517.8

160.160 Jain, P. K. Analysis and complex functions. Delhi, Mathematics, 1965-68. Varma, R.S., Dean, Faculty of Mathematics and Kamthan, P. K.

517.8

161.161 Jain, Sohan Pal. Functions of a complex variable. Delhi, Mathematics, 1964-67. Bhattacharya, P. B., Reader.

517.8

162.162 Kaliaperumal, Annamalai. Functions of a complex variable. Annamalai, Mathematics, 1964-67. Ganapathy Iyer, V., Professor.

It is proposed to study the maximal ideals and maximal subalgebras in algebras of continuous functions defined on a topological space, the relation between the topological properties of the space and the algebraic structure of continuous functions defined on it, and the purpose of Hardy class of functions in relation to algebraic structure.

517.8

163.163 Ratani, R. T. Certain problems in multivariate analysis. Gujarat, Statistics, 1966-69. Khatri, C. G., Reader.

The properties of admissibility, unbiasedness and invariance for Hotelling's T^2 test and multiple correlation coefficients in real and complex fields are being studied.

517.8

164.164 Somasundaram, Durairaj. Functions of several complex variables. Annamalai, Mathematics, 1965-68. Ganapathy Iyer, V., Professor.

The research covers the study of generalization of Banach space properties of analytical functions to the space of entire functions, extension of the properties of entire functions of one variable to two or more variables, and the space of entire functions of two variables and H^{∞} as a convolution algebra.

517.8

165.165 Sundararaman, Duraiswamy. Higher pure mathematics. Annamalai, Mathematics, 1966-69. Ganapathy Iyer, V., Professor.

517.8

166.166 Verma, H. K. Application of complex variable methods to plane elastostatic problems. Kurukshetra, Mathematics, 1964-67. Mitra, D. N., Asstt. Professor, I. I. T., Kharagpur.

517.8

Hypergeometric Functions

167.167 Bhagchandani, Laxmi Chand K. Study of hypergeometric series of two and more variables. Jodhpur, Mathematics, 1966-69. Mehra, K. N., Reader.

517.88

168.168 Denis, Remy Yohan. Hypergeometric series. Gorakhpur, Mathematics, 1963-67. Agarwal, Ratan Prakash, Professor of Pure Mathematics, Lucknow University.

Certain product theorems in hypergeometric type of series have been investigated. The results are of much interest as they include as their special cases many of the known results and the rest are new ones. A study of cognate trigonometrical series has been done which covers a dormant period of over a decade. Certain results for Meijer's G-function have also been established.

517.88

169.169 Mishra, Ramadhar. Theory of functions of a complex variable : Special functions. Gorakhpur, Mathematics, 1964-67. Agarwal, Ratan Prakash, Professor of Pure Mathematics, Lucknow University.

Some investigations relating to generalised hypergeometric functions and polynomials have been undertaken.

517.88

170.170 Shah, Manilal. On a study of generalised hypergeometric polynomials and their applications. Indore, Mathematics, 1966-68. Bhise, Vinayak Madhav, Reader, G.S.T. Institute, Indore.

It is the study of a generalised hypergeometric polynomial which, on specialising the parameters, yields polynomials of Rice, Bedient, Hermite, Jacobi, etc. Investigations include expansions, formulae, finite and infinite, integrals, generating functions, Rodrigue's formulae and integral equations involving the polynomials.

517.88

Higher Analysis

171.171 Balakrishnan, Panchapagesan. Higher analysis. Annamalai, Mathematics, 1965-68. Ganapathy Iyer, V., Professor.

The problems in the theory of univalent and p-valent functions are being attempted.

517.9

172.172 Bose, Kottasamy. Higher analysis. Annamalai, Mathematics, 1965-68. Ganapathy Iyer, V., Professor.

The theory of stochastic processes, queues and limit distributions is being studied.

517.9

173.173 Cheema, Sampuran Singh. Higher analysis using tools of functional analysis. B.I.T.S., Pilani, Mathematics, 1966-69. Krishnamurthy, V., Professor.

517.9

174.174 Datta, Mahesh Chandra. Higher analysis. B.I.T.S., Pilani, Mathematics, 1966-67. Krishnamurthi, V., Professor.

517.9

175.175 Jeyarajan, Peria nadar Arumugaswamy nadar. Higher analysis. Annamalai, Mathematics, 1966-69. Ganapathy Iyer, V., Professor.

The work is being done on the theory of summability and Tauberian theorems.

517.9

176.176 Raghavendran, Reghunatha Rao. Higher analysis. Annamalai, Mathematics, 1964-67. Ganapathy Iyer, V., Professor.

517.9

177.177 Suyambulingom, Chellappa nadar. Higher analysis. Annamalai, Mathematics, 1963-67. Ganapathy Iyer, V., Professor.

An attempt is being made to obtain the distribution of the maximum of the waiting time in a single server queue, when the arrival and service times are general distributions.

517.9

Mathematical Statistics

Probabilities

178.178 Gaikwad, Ratnaprabha Baburao. Some problems in statistical inference. Poona, Mathematics & Statistics. 1964-67. Huzurbazar, V. S., Professor and Head of the Department.

519.1

179.179 Garg, Sharda. Stochastic process in statistics. Kurukshetra, Mathematics, 1966-68. C. Mohan, Reader.

519.1

180.180 Handa, Balbir Raj. Study of some combinatorial aspects in probability theory and statistics. I. I. T., Delhi, Mathematics, 1966-69. Mohanty, S. G., Asstt. Professor.

The properties of compositions and partitions of an integer are being studied and their application to some problems in probability theory and statistics is under investigation.

519.1

181.181 Kharshikar, Anilkumar Vinayak. Statistical inference. Poona, Mathematics & Statistics, 1966-69. Huzurbazar, V.S., Professor and Head of the Department.

519.1

182.182 Marathe, Gunwant Bapurao. Contributions to the theory of estimation and testing of hypotheses. Poona, Mathematics & Statistics, 1964-67. Huzurbazar, V. S., Professor and Head of the Department.

519.1

183.183 Rajakule, Laxman Dullabh. Contribution to the theory of estimation and testing of hypotheses in inference. Poona, Mathematics & Statistics, 1964-67. Huzurbazar, V. S., Professor and Head of the Department.

519.1

184.184 Ray, Debaprata. Studies in robustness. Delhi, Mathematics, 1967-69. Varma, R. S.,Dean, Faculty of Mathematics and Chakravarti, N. K., Asstt. Director, Defence Science Laboratory, Delhi.

Any estimating procedure depends on the form of the probability distribution. The study aims at examining the robustness of different estimating procedures in order to choose the form of the distribution that leads to least error. It is also proposed to study the robustness of different statistical tests when the assumptions, on which these tests are based, are violated.

519.1

185.185 Sehgal, T. R. Optimum timing of traffic signals under mixed road traffic conditions. Delhi, Mathematics, 1965-68 Sinha, S. M., Reader.

519.1

186.186 *Tamhankar, Madhav Vishwanath.* Some non-parametric methods in statistical inference. Poona, Mathematics & Statistics, 1962-67. Bhapkar, V. P., Reader.

Decision procedures having desirable properties are being developed for the problems of selection and allocation or discrimination in the non-parametric set up.

519.1

187.187 Unnithan, T. K. Sreenivasan. Probability models. Kerala, Statistics, 1965-68. Krishna Pillai, R., Reader.

It is proposed to study stochastic process models and their applications in statistics.

519.1

Information Theory

188.188 Arora, P. N. Information theory and cybernetics. Delhi, Mathematics, 1964-67. Varma, R. S., Dean, Faculty of Mathematics.

519.7

189.189 Chhabra, Pran Nath. Information theory. I.I.T., Kanpur, Mathematics, 1966-69. Kapur, Jagat Narain, Professor and Head of the Department.

519.7

190.190 Prem Nath. The role of Markovian process in the study of sequential coding in information theory. Delhi, Mathematics, 1963-67. Varma, R. S., Dean, Faculty of Mathematics.

519.7

Treatment of Data

191.191 Banerjee, S. K. Estimation of dispersion by quasi-ranges. Delhi, Mathematics, 1957-67. Seth, G. R.

519.8

192.192 Naik, Umesh Durga. Analysis of variance. Karnatak, Statistics, 1962-67. Jambunathan, M. V., Professor (Retd.).

Given samples from p normal populations with equal variances, $N(\mu_i, \sigma^2)$, $i=1,2......,p$ (available in many analysis of variance model 1 problems), it is proposed to investigate some posteriori joint distributions of $\tau_i = \mu_i / \sigma$, $i=1,2...,p$, and Bayes multiple decision procedures concerning the populations.

519.8

193.193 Shah, Bhupendra Karsanlal. On the methods of fitting non-linear curve $\alpha+\delta x+\beta\rho^x$ and similar types. Baroda, Statistics, 1963-66. Bhatt, N. M., Professor and Head of the Department.

The thesis will deal with the methods of fitting non-linear curves of the type $E(y)=\alpha+\delta x+\beta \rho^x$, $E(y)=A+B_1 D_1^X+B_2 D_2^X$ and $E(y)=A+H X+B_1 D_1^X+B_2 D_2^X$ The first curve is studied in more detail because of its applications in the fields of pure science and electrical engineering. It will also contain useful tables for practical applications.

519.8

194.194 Sree Hari, Maddipatla. Contributions to limit theorems for dependent and independent variables. Mysore, Statistics, 1965-68. Pakshirajan, Rajakularaman Ponnusami, Professor and Head of the Department.

The limit distributions and the rates of convergence of these limits of certain functionals, defined on the partial sums of observations from a Markov chain, are being studied.

519.8

Programming

195.195 Adhikari, Basudeb. Contributions to incomplete block designs. Calcutta, Statistics, 1964-68. Nandi, H. K., Reader.

519.92

196.196 Aggarwal, S. P. Operational research. Delhi, Mathematics, 1963-67. Varma, R. S., Dean, Faculty of Mathematics.

519.92

197.197 Arjun Singh. Operations research. Delhi, Mathematics, 1963-67. Sinha, S. M., Reader.

519.92

198.198 Bagga, P. C. Sequencing and queuing problems. Delhi, Mathematics, 1966-69. Varma, R. S., Dean, Faculty of Mathematics and Chakravarti, N. K., Asst. Director, Defence Science Laboratory, Delhi.

It is proposed to find the best order of immediately available tasks to be completed on a machine, in a fixed sequence, to minimize total elapsed time and to minimize the total waiting. Complex scheduling problems, priority problems and machine failure problems will also be discussed.

519.92

199.199 Bajaj, Chandra Prakash. Operational research. Delhi, Mathematics, 1965-68. Sinha, S. M., Reader.

519.92

200.200 Bajaj, M. P. Operational research. Delhi, Mathematics, 1964-67. Sinha, S. M., Reader.

519.92

201.201 Balbir Singh. Operations research. Delhi, Mathematics, 1963-67. Varma, R. S., Dean, Faculty of Mathematics.

519.92

202.202 Bansal, Shri Prakash. Operations research. Delhi, Mathematics, 1963-67. Sinha, S. M., Reader.

519.92

203.203 Bansi Lal. Operational research. Delhi, Mathematics, 1962-67. Varma, R. S., Dean, Faculty of Mathematics.

519.92

204.204 Bector, Chhajju Ram. Mathematical programming. I.I.T., Kanpur, Mathematics, 1964-67. Kapur, Jagat Narain, Professor and Head of the Department.

A class of functions for optimisation techniques and optimisation of different functions subject to inequality restrictions has been investigated. Most of the research work is directed towards fractional and indefinite nonlinear mathematical programming.

519.92

205.205 Bhansali, S. M. Operations in mathematics. Delhi, Mathematics, 1965-68. Varma, R. S., Dean, Faculty of Mathematics.

519.92

206.206 Bhattacharya, S.K. Operational research. Delhi, Mathematics, 1965-68. Sinha, S. M., Reader.

519.92

207.207 Chopra, S. K. Operational research. Delhi, Mathematics, 1964-67. Sinha, S. M., Reader.

519.92

208.208 Gahlawat, Balbir Singh. Operational research. Delhi, Mathematics, 1962-67. Varma, R. S., Dean, Faculty of Mathematics.

519.92

209.209 Gaiha, Prabha. Operations research. Delhi, Mathematics, 1965-68. Sinha, S. M., Reader.

519.92

210.210 Gogia, Narendra Kumar. Mathematical programming. I.I.T., Kanpur, Mathematics, 1963-67. Kapur, Jagat Narain, Professor and Head of the Department.

A study of nonlinear constrained optimization problems in mathematical programming has been undertaken

519.92

211.211 Gopalan, M. N. Application of stochastic processes to operations research. I. I. T., Bombay, Mathematics, 1963-67. Independently.
519.92

212.212 Goyal, T. L. Operational research. Delhi, Mathematics, 1965-68. Varma, R. S., Dean, Facultv of Mathematics.
519.92

213.213 Gupta, Murarilal Pyarelal. Response surface designs. Baroda, Statistics, 1964-66. Patel, M. S., Reader.
519.92

214.214 Gupta, Radha Krishan. Mathematical programming. Delhi, Mathematics, 1964-67. Sinha, S. M., Reader.
519.92

215.215 Gupta, Rajendra Prasad. Mathematical programming. I.I.T., Kanpur, Mathematics, 1964-67. Kapur, Jagat Narain, Professor and Head of the Department.
519.92

216.216 Gupta, Sneh Lata. Operational research. Delhi, Mathematics, 1965-68. Sinha, S. M., Reader.
519.92

217.217 Hasija, R. L. Operations research. Delhi, Mathematics, 1967-69. Varma, R. S., Dean, Faculty of Mathematics and Jaiswal, N. K., Senior Scientific Officer (I), Defence Science Laboratory, Delhi.
519.92

218.218 Jain, Darshan Lal. Mathematical programming. Delhi, Mathematics, 1963-67. Varma, R. S., Dean, Faculty of Mathematics.
519.92

219.219 Jain, Gopi Chand. Mathematical programming. Delhi, Mathematics, 1964-67. Gupta, H. C., Reader.
519.92

220.220 Jain, H. C. Operational research. Delhi, Mathematics, 1965-68. Varma, R. S., Dean, Faculty of Mathematics and Jaiswal, N. K., Senior Scientific Officer (I), Defence Science Laboratory, Delhi.
519.92

221.221 Jain, Jati Lal. Operational research. Delhi, Mathematics, 1962-67. Varma, R. S., Dean, Faculty of Mathematics.
519.92

222.222 Jaur, R. P. Operational research. Delhi, Mathematics, 1964-67. Sinha, S. M., Reader.
519.92

223.223 Jindal, K. K. Operational research. Delhi, Mathematics, 1965-68. Sinha, S. M., Reader.
519.92

224.224 Kanti Swarup. Mathematical programming. Delhi, Mathematics, 1962-67. Varma, R. S., Dean, Faculty of Mathematics.

519.92

225.225 Kaul, T. N. Operational research. Delhi, Mathematics 1962-67. Varma, R. S., Dean, Faculty of Mathematics.

519.92

226.226 Khurana, R. K. Operational research. Delhi, Mathematics, 1966-69. Sinha, S. M., Reader.

519.92

227.227 Kulshrestha, D. K. Maintenance problems in operational research. Delhi, Mathematics, 1963-67. Varma, R. S., Dean, Faculty of Mathematics and Srivastava, S. S., Director, Scientific Evaluation Directorate, Ministry of Defence, Delhi.

519.92

228.228 Lal, S. S. Operational research. Delhi, Mathematics, 1965-68. Sinha, S. M., Reader.

519.92

229.229 Malhotra, N. K. Operations research. Delhi, Mathematics, 1963-67. Sinha, S. M. Reader.

519.92

230.230 Mehandiratta, S. L. Operational research. Delhi, Mathematics, 1963-67. Sinha, S. M., Reader.

519.92

231.231 Mittal, R. C. Operations research. Delhi, Mathematics, 1963-67. Sinha, S. M., Reader.

519.92

232.232 Murthy, J. S. Problems of construction and analysis of designs of experiments. Delhi, Mathematics, 1963-67. Das, M. N., Professor.

519.92

233.233 Naregal, Damayanti Ranna. Queuing theory : Problems on queues with bulk service system. Karnatak, Statistics, 1965-67. Bhat, Beliyar Ramdas, Head of the Department.

Applying the idea of cost functions to queuing and storage systems, optimum policies are proposed to be obtained.

519.92

234.234 Pritam Das. Operational research. Delhi, Mathematics, 1960-67. Varma, R. S., Dean, Faculty of Mathematics.

519.92

235.235 Radha Krishan. Operational research. Delhi, Mathematics, 1963-67. Sinha, S. M., Reader.

519.92

236.236 Rana, Ramkaran. Operations research. Kurukshetra, Mathematics, 1965-68. C. Mohan, Reader.

519.92

237.237 Sachan, Ram Shanker. Problems in mathematical programming. I.I.T., Kanpur, Mathematics, 1965-68. Kapur, Jagat Narain, Professor and Head of the Department.

In programming problems, the variables known as control or decision variables are functions of parameters. The problem is called stochastic, if some or all parameters are random. Various approaches with varying characteristics are (1) Multistage decision procedures for both stochastic and nonstochastic problems; (2) Procedures for finding optimal decisions under some probability distribution with random constraints; (3) Introduction to utility function to take account of risk; and (4) Analysis of probability distribution for problems with random constraints and/or objective functions.

519.92

238.238 Santosh Kumar. Dynamic programming models in operational research. Delhi, Mathematics, 1966-69. Varma, R. S., Dean, Faculty of Mathematics and Srivastava, S.S., Director, Scientific Evaluation Directorate, Ministry of Defence, Delhi.

519.92

239.239 Shah, Shantilal Mangaldas. Problems in truncated distributions and experimental designs. Baroda, Statistics, 1963-67. Bhatt, N. M., Professor and Head of the Department.

It is proposed to study (1) Properties of balanced incomplete block designs and partially balanced incomplete block designs about upper bounds for the number of blocks, bounds for the number of common treatments etc., (2) Problems in binomial and negative binomial distributions, and (3) Problems in statistical inference.

(1) Proc. AMS. 35; 1964 : p. 398-407; (2) ibid. 36; 1965: p. 337-342; and (3) JISA. 2; 1964 : p. 41-51.

519.92

240.240 Suba Rao, S. Operational research: Queuing theory. Delhi, Mathematics, 1964-67. Varma, R. S., Dean, Faculty of Mathematics and Jaiswal, N. K., Senior Scientific Officer (I), Defence Science Laboratory, Delhi.

519.92

241.241 Suresh Chandra. Mathematical programming. I.I.T., Kanpur, Mathematics, 1965-68. Gupta, Surendra Kumar, Assoc. Lecturer.

A number of algorithms are available for the transportation and assignment problems in linear programming. The present study is devoted to transportation and assignment problems in nonlinear programming e.g. L.F. F.P., quadratic programming, stochastic programming and others. The multi-index and fractional T.Ps in stochastic programming are under study.

519.92

242.242 Tuteja, R. K. Operational research. Kurukshetra, Mathematics, 1965-67. C. Mohan, Reader.

519.92

243.243 Vij, Ram Nath. Operations research. Delhi, Mathematics, 1963-67. Varma, R. S., Dean, Faculty of Mathematics

519.92

244.244 Wadwa, Bhushan Lal. Operations research. Delhi, Mathematics, 1963-67. Varma, R. S., Dean, Faculty of Mathematics.

519.92

Sampling and Quality Control

245.245 Amanullah. Statistical inference sampling. Aligarh, Mathematics, 1966-69. Mumtaz Ali, S., Lecturer.

519.93

246.246 Choudhury, Sumedha. On some statistical problems of life testing and reliability analysis. I. I. T., Kharagpur, Mathematics, 1964-67. Gayen, A. K., Professor and Head of the Department.

The problems regarding estimation and hypothesis testing of parameters for a life time distribution of components are studied. Bay's approach to reliability and life testing is studied and optimum sampling plans with respect to the risk involved in a wrong decision are derived.

519.93

247.247 Gulab Rai. Cumulative sum control charts and sampling plans. I.I.T., Kharagpur, Mathematics, 1964-67. Gayen, A. K., Professor and Head of the Department.

Cumulative sum control charts for several distributions occurring in industry have been constructed. Sampling plans based on cost function have been proposed.

519.93

248.248 Handa, B. R. Statistical inference and non-parametric tests. Delhi, Mathematics, 1964-67. Gulati, R. L., Reader.

519.93

249.249 Jaiswal, M. C. Some topics on mathematical statistics. Gujarat, Statistics, 1966-69. Khatri, C. G., Reader.

The equality of parameters in certain non-regular densities is being tested.

519.93

250.250 Kirmani, S. Nizamuddin Ahmad. Some problems in statistical inference. Aligarh, Mathematics & Statistics, 1966-69. Mumtaz Ali, S., Lecturer.

519.93

251.251 Nagnur, Bodh Narasimh. Large sample tests. Karnatak, Statistics, 1963-67. Bhat, Beliyar Ramdas, Head of the Department.

Locally asymptotically most stringent test (LAMST) has been defined for testing composite hypothesis. LAMST is derived for testing the general linear hypothesis. It is shown that LAMST yields large sample test equivalent to likelihood ratio test. Criteria have been obtained for testing the hypothesis of no three factor interaction in contingency tables.

Biometrika. 52; 1965 : p. 459-468.

519.93

252.252 Nandi, Sudangshu Bhushan. Study of some problems of sampling distributions and of power function of certain tests of significance. Gauhati, Statistics, 1965-68. Medhi, Jyoti Prasad, Professor.

An attempt is being made to study some problems in connection with the mean square successive difference and other related problems. The effect of non-normality on the normally constructed test functions and also on the power functions has been investigated. Mellin transformation has been applied to obtain certain well-known probability density functions.

519.93

253.253 Naunihal Singh. Estimation from censored and truncated samples. Delhi, Mathematics, 1962-67. Iyer, P. V. K.

519.93

254.254 Srivastava, Tej Narain. Sampling inspection and life testing. Delhi, Mathematics, 1966-69. Varma, R. S., Dean, Faculty of Mathematics and Chakravarti, N. K., Asstt. Director, Defence Science Laboratory, Delhi.

Investigations in the field of acceptance sampling in life testing are planned. The word life stands for the specified life of service stores, electronic components etc.

519.93

255.255 Tatke, Jayant Vishnu. Application of statistical methods in Indian industries. Poona, Mathematics & Statistics, 1965-67. Huzurbazar, V. S., Professor and Head of the Department.

519.93

256.256 Tripathi, T. P. Sampling theory. Aligarh, Mathematics & Statistics, 1965-68. Kokan, A. R., Lecturer.

519.93

257.257 Varshney, J. C. Sampling. Aligarh, Mathematics & Statistics, 1966-69. Kokan, A. R., Lecturer.

519.93

For Statics, Dynamics and Ballistics

See

PHYSICS, MECHANICS

ASTRONOMY

258.1 Somayaji, D. Arka. A critical study of the ancient Hindu astronomy in the light and language of the modern astronomy. Karnatak, Mathematics, 1963-67. Srinivasiengar, C. N., Professor and Head of the Department (Retd.).

It is proposed to restate the processes and results of ancient Indian astronomy in proper mathematical form and symbology of modern astronomy. The mathematical principles underlying the works of ancient Indian scholars, particularly Bhaskara, have been worked out systematically both by western methods, and by the methods adopted by Indians.

520.9

Photometry

259.2 Desika Chari, Krishna. Photoelectric photometry of certain eclipsing and intrinsic variables. Osmania, Astronomy, 1964-67. Sarma, Mukkamala Balakrishna, Reader.

A programme to study photoelectrically certain eclipsing variables with one of the components belonging to the late spectral types is undertaken. In cases where the late type component is also an intrinsic variable, observations in red and infrared are planned with a view that this will help resolving the actual nature of intrinsic variability. So far, photoelectric work has been done on the β CM$_a$ star ν Eridani, both at the Nizamiah and Nainital Observatories.

522.623

Descriptive Astronomy

Cosmology

260.3 Bandyopadhyay, Srivanjan. Problems in cosmology and general theory of relativity. Calcutta, Applied Mathematics, 1962-67. Raychaudhuri, A. K., Professor.

523.1

261.4 Rajamohan, Rajagopalan. Determination of the velocity ellipsoid in the galactic plane at different distances from the sun. Osmania, Astronomy, 1965-68. Abhyankar, Krishna Damodar, Professor.

The determination of the velocity ellipsoid at different distances from the sun would give an insight into the structure and kinematics of the galaxy. This would need observations of radial velocity, proper motions and parallax of stars fainter than 7th magnitude. With the available observational data, a statistical method will be devised to determine the velocity ellipsoid in the galactic plane at different distances from the sun. Photoelectric observations for 7 nights have been done on a β canis majoris variable star, ν Eridani at Nizamiah Observatory and at U. P. State Observatory, Nainital.

523.12

262.5 Swaminathan, Ramamurthy. A study of the structure and internal motions of gaseous nebulae. Osmania, Astronomy, 1963-66. Karandikar, Ramachandra Vinayak, Professor and Head of the Department.

A photographic Fabry-Perot interferometer has been constructed and used to study the fringe systems of laboratory sources for determining correct wavelengths. Some photometric study has been done on some stars, using the 15″ telescope at the Nizamiah Observatory with an 1P21 photomultiplier, to derive extinction coefficients for various nights. A photoelectric Fabry-Perot interferometer which is being designed and constructed, will be used with the 48″ telescope to study some emission nebulae.

523.12

Planets

263.6 Narahari Rao, Kondisetti. Interferometric, spectroscopic and other optical studies of planetary atmospheres. Osmania, Astronomy, 1963-66. Karandikar, Ramachandra Vinayak, Professor and Head of the Department.

Two interferometric instruments have been designed. These will be used with 48″ reflector for planetary studies. Some photometric work has been done with 15″ telescope using RCA 1P21 photomultiplier at the Nizamiah Observatory. The presence of oxygen and water vapour in atmospheres of mars and venus will be determined from the distortion of line contours.

523.4

Meteores

264.7 Raghavender Rao, Chokkasamudram. Spectroscopic and interferometric studies of certain low light level astronomical sources. Osmania, Astronomy, 1964-67. Karandikar, Ramachandra Vinayak, Professor and Head of the Department.

Some laboratory sources have been studied with a constant deviation spectrograph and with the same instrument crossed with a Fabry-Perot etalon. Some theoretical work concerning the upper atmospheric helium emission at λ 10830 A has also been done. The construction of a 4″ photoelectric Fabry-Perot interferometer to be used in the study of some of the upper atmospheric emissions is in progress. It will also be possible to study the emissions from the dark side of venus when it is used with a 48″ reflector.

523.57

Stars

265.8 Chander Mohan. Stellar pulsation. Roorkee, Mathematics, 1965-67. Chandrika Prasad, Professor and Head of the Department.

In the case of pulsating stars, so far it has not been possible to explain theoretically the observed pulsation periods, skewness of the radial velocity curve, the phase lag, and the physical cause of setting in of pulsational instability. These problems are being investigated in the light of suitable theoretical models.

523.83

266.9 Ganesh, Kavi Shankar Bhat. Spectrographic studies of early type stars. Karnatak, Astrophysical Observatory, Kodaikanal, 1963-66. Vainu Bappu, M. K., Director, Astrophysical Observatory, Kodaikanal.

The investigation aims at a detailed study of the spectroscopic characteristics of the Wolf-Rayet stars. For binary systems, spectrophotometry and radial velocity measures permit the evaluation of masses and orbit parameters. The photometric observation of emission lines from the ultraviolet to the near infrared permits the study of the excitation characteristics of the Wolf-Rayet atmosphere.

523.87

267.10 Kameswara Rao, Neelamraju. Photoelectric observations of β canis majoris stars. Osmania, Astronomy, 1965-68. Abhyankar, Krishna Damodar, Professor.

The photoelectric observations of β canis majoris star (ν Eridani) have been done at the Nizamiah Observatory on the 15″ refractor attached with 1P21 photomultiplier in two colours and also on the 20″ reflector attached with E.MI 6094 photomultiplier in UBV colours at U.P. State Observatory. The work on these stars will be done on the 48″ reflector soon after its installation at Rangapur. A photoelectric photometer for the 48″ reflector is under construction in the workshop of the Nizamiah Observatory.

523.8

268.11 Karanjai, Sitansubimal. On the mathematical problems of non-coherent scattering in stellar atmosphere. North

Bengal, Mathematics, 1966-69. Dasgupta, Santi Ranjan, Reader and Head of the Department.

The work is an attempt to remove some defects in Sobolev's paper on non-coherent scattering in stellar atmosphere, as pointed out by Busbridge. It is also proposed to obtain exact mathematical solution of the difficult problem of partly coherent and partly non-coherent scattering in stellar atmosphere from view points not covered by earlier investigators.

523.81

269.12 Khandelwal, R. S. Investigation of proper motions of stars from comparison of Paris astrographic catalogues and Potsdam photographische himmels karte. Rajasthan, Mathematics, 1966-68. Goyal, A. N., Lecturer.

It is intended to compare more than ninety regions, common to both Potsdam photographische himmels karte and Paris astrographic catalogues containing nearly 40,000 stars in +34° and +35°. It is expected to yield about 4,000 stars with large proper motions. These stars along with those obtained in Oxford +32° and +33° by A. N. Goyal and S. Aravamudan will be utilised perhaps for the first time to examine the stellar kinematics.

523.83

270.13 Malhotra, Chaman Lal. Structure and pulsation of stars. Roorkee, Mathematics, 1964-67. Chandrika Prasad, Professor and Head of the Department.

It is proposed to construct certain stellar models and to investigate their pulsation when the periods of two of the models are very nearly commensurable.

Small radial oscillations of the standard model with commensurable periods. Roorkee Uni. Res. Jour. June, 1966.

523.83

271.14 Manmohan Singh. Pulsation theory of variable stars. Roorkee, Mathematics, 1965-67. Chandrika Prasad, Professor and Head of the Department.

It is proposed to consider the pulsational properties of variable stars. The harmonic and anharmonic pulsations of a composite Roche's model and a composite polytrope have been obtained. It is planned to construct a model which gives a suitable period of pulsation as well as the requisite asymmetry of the radial velocity curve.

(1) Radial oscillations of a composite model. Roorkee Uni. Res. Jour. 8(3&4) : p.1-7; and (2) Anharmonic pulsations of a composite model. ibid. 8(3&4) : p. 9-13.

523.83

Chronology

Calendars

272.15 Chakrabarti, Apurba Kumar. Hindu calendar system from vedic to siddhantik period. Calcutta, Applied Mathematics, 1963-67. Lahiri, N. C.

529.3245

PHYSICS

Relativity Theory

273.1 Abrol, Mohan Lal. A comparative study of unified field theories of relativity. Delhi, Mathematics, 1956-67. Ram Behari, Vice-Chancellor (Retd.), Jodhpur University.

530.11

274.2 Deshpande, Shreekant Vinayak. Some mathematical aspects of the theory of relativity. Poona, Mathematics & Statistics, 1961-68. Narlikar, V. V., Lokamanya Tilak Professor of Applied Mathematics.

530.11

275.3 Harihar Prasad. Cylindrical wave solutions of some field equations in general relativity. Gorakhpur, Mathematics, 1963-66. Lal, K. B., Professor and Head of the Department.

Cylindrical wave solutions of the following equations have been worked out : (a) Generalised Maxwell's equations ; (b) Einstein's gravitational field equations also containing electromagnetic field ; and (c) Einstein's unified field equations of gravitation and electromagnetism.

(1) Tensor, New Series. 16(3) ; Sep. '65 : p. 209-224 ; and (2) ibid. 17(2) ; March '66 : p.179-184.

530.11

276.4 Johri, Vinod Behari. Plane gravitational waves in Bondi space time. Gorakhpur, Mathematics, 1962-66. Lal, K.B., Professor and Head of the Department.

Exact plane wave solutions of the field equations in general relativity have been obtained and the results arrived at by Bondi have been extended to non-empty space time.

(1) Prog. Theo. Phys. 35(1) ; 1966 ; and (2) Acad. Prog. Maths. 1(1) ; 1966.

530.11

277.5 Khare, Dinesh Chandra. Theory of relativity. Gorakhpur, Mathematics, 1966-68. Lal, K. B., Professor and Head of the Department.

Investigations on certain problems in gravitational waves have been undertaken.

530.11

278.6 Marathe, Kishore Balkrishna. Post-Einstein theories of gravitation. Poona, Mathematics & Statistics, 1963-68. Narlikar, V. V., Lokamanya Tilak Professor of Applied Mathematics.

530.11

279.7 Mehra, Amrit Lal. Some problems in general theory of relativity. Jodhpur, Mathematics, 1963-67. Kushwaha, R. S., Professor and Head of the Department.

The variation of gravitational potentials and pressure has been studied with different variable densities and for the isothermal and incompressible fluid spheres. The Birkhoff's theorem has been extended to electromagnetic field and the energy of a charged particle obtained. It is shown that the fourth component of gravitational force corresponds to Hubble's expansion.

(1) Curr. Sci. 35 ; 20th June '66 : p. 304 ; and (2) Jour. Aus. Math. Soc. 6(2) : p. 153-156.

530.11

280.8 Nazaf Ali. Gravitational waves. Gorakhpur, Mathematics, 1966-68. Lal, K. B., Professor and Head of the Department.

Unified field equations of general relativity are being investigated.

530.11

281.9 Ram Achal Singh. General theory of relativity. Gorakhpur, Physics, 1961-66. Sharma, D., Professor and Head of the Department.

A new formulation of the gravitational radiation has been given in analogy with the electromagnetic field.

530.11

282.10 Raval, Hasmukh Manilal. Some studies on relativistic cosmological models in the general theory of relativity. Gujarat, Mathematics, 1962-68. Vaidya, P. C., Professor and Head of the Department.

The cosmological problem deals with the smoothed out geometrical structure of the universe by means of solving the gravitational field equations of the general theory of relativity. Some solutions which represent stationary and non-static rotating universes with shear and with or without electromagnetic field have been obtained. Further problems in this direction are being formulated.

(1) Curr. Sci. 34(6) ; 20th March '65 : p. 175 ; (2) ibid. 36(1) ; 5th Jan. '67 : p. 7 ; and (3) Ann. Inst. Henri Poincare. 4(1) ; 1966 : p. 21-29.

530.11

283.11 Tiwari, R. N. Some problems in general and unified field theory of relativity. I. I. T., Kharagpur, Mathematics, 1965-67. Rao, J. R., Asstt. Professor.

In general theory, certain electromagnetic solutions for cylindrical symmetry of class one have been obtained. In unified field theory, some solutions have been obtained for plane symmetric fields for Schrödinger's para form field equations.

530.11

Quantum Theory

284.12 Biswas, Arbinda. Waves in layered media. I. I. T., Kharagpur, Mathematics, 1965-67. Sinha, S. B., Lecturer.

The investigation deals with the problems of propagation and transmission of waves through layered media which are of different types. In case of transmission, the layers are sandwiched between half spaces which are of the same kind having the same material properties.

530.12

285.13 Chowdhury, Kashmiri Lal. Integral operators in quantum mechanics. Delhi, Mathematics, 1961-67. Dhaliwal, R. S.

530.123

286.14 Kundra, Mangal Das. Quantum mechanics. Delhi, Mathematics, 1964-67. Srivastava, T. P., Reader.

530.123

Field Theories

287.15 Sarkar, Ramatosh. Studies in Schrödinger's unified field theory. Calcutta, Physics, 1963-67. Bandyopadhyay, G., Assoc. Professor, Department of Physics, I. I. T., Kharagpur.

The analogues of Bianchi identities, rigorous solutions of the field equations, their physical interpretations etc., are being looked for in Schrödinger's unified field theory.

(1) Jour. Math. Mech. 14(2) ; 1965 : p. 183-194 ; and (2) Tensor. 17(3) ; 1966 : p. 227-237.

530.142

Solid State Physics

288.16 Das, Kartikchandra. Studies on some aspects of metallic solids. Calcutta, Physics, 1964-67. Ray, D. K.

530.41

289.17 Date, Sadgopal Kashinath. Solid state physics. Bombay, Institute of Science, 1964-67. Bhide, V. G., Professor and Head of the Department of Physics.

The mossbauer effect for Fe^{57} in various alloys, such as, iron germanium, iron aluminium etc., is being investigated. The mossbauer spectra in polynuclear iron complexes have shown relaxation effects at low temperatures and permitted the observation of hyperfine structures in their paramagnetics.

530.41

290.18 Hausila Prasad Singh. X-Ray investigations of solid physics. Banaras, Physics, 1965-67. B. Dayal, Professor and Head of the Department.

To study the thermal expansion of solids by X-ray method, the coefficients of thermal expansion of zinc selenide and rhodium have been measured. Work on other metals and alloys is in progress.

530.41

291.19 Kulkarni, S. S. Solid state physics. Bombay, Institute of Science, 1963-67. Bhide, V. G., Professor and Head of the Department of Physics.

The domain structure of ferroelectric titanates is being investigated using multiple beam interference techniques. The domain dynamics in steady and oscillating electric fields is also being investigated.

530.41

Mechanics of Solids

Dynamics

292.20 Chattopadhyay, Probod Kumar. Investigations on mechanical hysteresis. Calcutta, Physics, 1960-67. Baral, S. S., Professor, Bengal Engineering College, Howrah.

531.3

293.21 Samanta, Basanta Kumar. Problems of rotation of homogeneous and non-homogeneous elastic bodies. Burdwan, Mathematics, 1963-66. Sen, B., Professor of Mathematics, Visva-Bharati.

The problems of non-homogeneous elastic bodies having rotation have been solved. Results of practical interest have been obtained in the case of different earth models and further work on these lines is in progress.

(1) Note on non-homogeneous rotating circular disk. Ind. Jour. Theo. Phys. 12(2) ; 1964 : p. 41-48 ; (2) Stresses in an anisotropic non-homogeneous rotating circular disk of variable thickness. Rev. Roum. des Sci. Tech. Mech. App. 11(2) ; 1966 : p. 503-511 ; (3) Note on a nonhomogeneous cylindrically acolotropic rotating long cylinder. Ind. Jour. Mech. Math. 3(2) ; 1965 : p. 93-98; (4) Stress distribution in a rotating composite sphere.

Jour. Sci. Engg. Res. 9(2) ; 1965 : p. 332-342 ; (5) Note on the stress distribution in a rotating composite sphere. JAM. 33(2) ; 1966 : p. 443-445; (6) Stress distribution in a thin rotating circular disk having transient shearing stress applied on the outer edge. Jour. Fran. Inst. 281(4); 1966 : p. 315-323; and (7) Stresses in different rotating spherical earth models with rigid core. PAGEOPH. 63(1) ; 1966 : p. 23-26.

531.34

294.22 Vasudevan, R. Studies in nonlinear oscillations as applied to the initial vibrations of a spinning shell and other problems. Delhi, Mathematics, 1965-68. Thiruvenkatachar, V. R.

531.32

Elasticity and Deformation

295.23 Agarwal, M. K. Studies of the microstructures of panna diamonds and their etch patterns. Patel, Physics, 1963-67. Patel, A. R., Professor and Head of the Department.

Microstructures of the panna diamonds and their etch patterns have been studied for the first time. Fast etching of diamond surfaces has also been carried out. The results throw light on the growth and history of the diamond. The investigation on diamond boarts is in progress.

531.382

296.24 Bahl, Om Prakash. Studies on the etch patterns of graphite. Patel, Physics, 1963-66. Patel, A. R., Professor and Head of the Department.

Graphite cleavages have been etched in various melts at elevated temperatures and from the study of the etch patterns, the formation of holes has been explained. Dislocations of various types have been indexed by using a selective etchant. Interlacing as well as interfering spirals, resembling those observed due to growth on natural faces of various crystals, have been produced by etching. A comparative etch rate study of screw and edge dislocations has been made. A detailed study regarding the anisotropy in the oxidation rate is being made.

531.382

297.25 Bahl, S. K. Stress distribution around a hole in otherwise infinite media in an elastic and plastic state. Aligarh, Physics, 1964-67. Rais Ahmed, Professor and Head of the Department (Int.) and Agarwala, B. K. (Ext.).

531.381

298.26 Bharatha, S. Finite deformations of elastic media. I. I. T., Kharagpur, Mathematics, 1966-68. Kaul, C. N., Asstt. Professor.

Generalizing the previous work based on the assumption that the pressure is a function of a single variable, cylindrically symmetrical deformations of Mooney materials are treated by taking the hydrostatic pressure to be a general function of the spatial co-ordinates.

531.38

299.27 Biswas, Rathindranath. Mathematical theory of elasticity. Calcutta, Physics, 1964-67. Dasgupta, S. C., Professor, Applied Mathematics, Bengal Engineering College, Howrah.

531.38

300.28 Chaudhuri, Prasanta Kumar. Problems on mathematical theory of elasticity. Calcutta, Physics, 1964-67. Dasgupta, S. C., Professor, Applied Mathematics, Bengal Engineering College, Howrah.

531.38

301.29 Chillayil, Purushothaman. Molecular dynamics. Kerala, Physics, 1963-66. Venkateswarlu, K., Professor and Head of the Department.

Investigations have been carried out on various aspects of molecular vibrations viz., force constants, mean amplitudes of vibration, coriolis coefficients, shrinkage effect and thermodynamic properties of several polyatomic molecules.

(1) Mean amplitudes of vibration : SEO_3 and ClF_3 Proc. IAS. 60 ; 1964 : p. 431; (2) Mean amplitudes of vibration of borine carboryl. IJPAP. 3(10) ; 1965 : p. 377 ; and (3) Mean amplitudes of vibration and thermodynamic properties of methyl cyanide and methyl isocyanide. Chk. Jour. Phys. 3(16); 1966: p. 144.

531.383

302.30 Desai, C. C. Studies on etching of natural and synthetic calcium fluoride cleavages. Patel, Physics, 1962-66. Patel, A. R., Professor and Head of the Department.

The dislocation contents of natural and synthetic calcium fluoride cleavages have been worked out and the history of growth of the calcium fluoride crystals has been described. The work on the irradiated crystals of CaF_2 is in progress.

531.382

303.31 Ghosh, Subhaschandra. Elasticity. Calcutta, Physics, 1965-67. Chaudhuri, P.

531.38

304.32 Giri, Chandra Shekhar. Vibration problems of beams and plates on elastic foundations. Roorkee, Mathematics, 1965-67. Chandrika Prasad, Professor and Head of the Department.

It is proposed to study the vibrations of beams and plates placed on elastic foundation instead of rigid foundation. The effect of elastic foundation has been accounted for by using Winkler's theory.

531.383

305.33 Gupta, Anand Prakash. Elastic and plastic vibrations in plates and shells. Roorkee, Mathematics, 1965-67. Chandrika Prasad, Professor and Head of the Department.

It is proposed to consider the transverse vibrations of the bar type and the solid rectangular beams. In the box type beams, the effect of shear forces and the rotatory inertia has been considered and the sides, top and bottom have been taken to bend through different angles. In the rectangular beam, the effect of including shear term of second order in thickness is being investigated.

531.383

306.34 Gupta, Rajendra Prasad. Some problems on creep theory. Roorkee, Mathematics, 1964-67. Bhatnagar, Narendra Swaroop, Reader.

It is proposed to consider the mathematical solutions of creep problems. Solutions of some problems on membranes and rotating discs have been obtained. Theoretical framework for study of creep in an isotropic medium is being developed.

On the constitutive equations of orthotropic theory of creep. Jour. Phys. Soc. Japan. 21(4); April '66.

531.382

307.35 Gupta, Sushil Chand. Inclusion problems in elasticity. I.I.T., Kanpur, Mathematics, 1964-67. Bhargava, Rajeshwar Dayal, Professor.

531.38

308.36 Ittyachen, M.A. Study of growth patterns and dislocation in apophyllite crystals. Patel, Physics, 1965-68. Joshi, M.S., Reader.

The faces of natural apophyllite crystals are being studied to determine their history and mechanism of growth. A study of the growth patterns will throw some light on the mechanism of growth, while that of the dissolutions of the faces is expected to show how the faces might have grown. Different etchants, suitable to reveal the dislocation sites on the crystals, have been developed to find out the dislocation content of these crystals. The morphology and development of the etch pits are under investigation.

531.382

309.37 Jain, Raj Krishan. Elastic problems in shells. Roorkee, Mathematics, 1963-67. Chandrika Prasad, Professor and Head of the Department.

The vibrations of elastic shells, isotropic as well as anisotropic, of various shapes have been studied. Free vibrations of spherical, cylindrical and conical shells are being investigated.

Vibrations of transversely isotropic cylindrical shells of finite length. Jour. Acoust. Soc. Amer. 38 (6): p. 1006-1009.

531.383

310.38 Manik Chandra. Lattice vibrations. I.I.T., Delhi, Physics, 1966-69. B. Sharan, Asstt. Professor.

A detailed knowledge of the phonon frequency distribution is essential for the determination of most of the physical properties of solids. The theoretical ionic radii and van der Waal's forces required to explain the stability of the caesium halides are being made consistent with X-ray data and the theoretical calculations.

531.383

311.39 Md. Moulana. Some problems of the mathematical theory of elasticity. Osmania, Mathematics, 1965-67. Siddiqui, Mohd. Mahfooz Ali, Reader.

The problems of torsion and flexure of bars of single and composite materials are being tackled with different cross-sections and complex variable methods. Work is proposed to be done on the lines given in the papers of D. I. Sherman on the same subject.

531.38

312.40 Pande, Dayashanker. Finite elasticity. I. I. T., Kanpur, Mathematics, 1962-67. Bhargava, Rajeshwar Dayal, Professor.

531.38

313.41 Ramachandran, N. Studies on synthetic diamond. Patel, Physics, 1964-67. Patel, A. R., Professor and Head of the Department.

Studies have been made on the micro-structures of different faces of synthetic diamond manufactured by G.E.C. (U.S.A.), ASEA (Sweeden) and U. S. Army Electronic Research Development Laboratory. Attempts have been made to cleave some of these crystals and the cleavage faces, etched at different temperatures with suitable etchants, have been studied. Etch patterns of the cleavages doped with boron and aluminium impurities have been compared with those of undoped ones. Micro-natural diamonds have been examined and spiral growth has been observed for the first time on their octahedral faces.

531.382

314.42 Ram Kumar. Vibrations of isotropic elastic bodies. Delhi, Mathematics, 1965-68. Aggarwal, R.R., Asstt. Director, Applied Mathematics Division, Defence Science Laboratory, Delhi.

The vibrations of finite isotropic cylinders and plates have been studied with the help of exact three dimensional equations of motion. An attempt has been made to satisfy the boundary conditions at the free surface of the plate and cylinder. The resonant frequencies of composite cylinders have been studied. These have also been studied in the presence of fluid in or around the body and the corresponding approximate theorems have been modified. The vibrations of plate, cylinder and sphere will also be studied in the presence of magnetic field around these bodies.

531.383

315.43 Roy, Amiya Bhushan. Dynamical problems of elasticity. Burdwan, Mathematics, 1962-66. Chakrabarty, Sakti Kanta, Reader.

531.38

316.44 Santosh Kumar. Studies on some aspects of vibrations in solids. Calcutta, Physics, 1964-67. Ray, D. K.

531.383

317.45 Sarkar, Sujitkumar. Elasticity. Calcutta, Physics, 1964-67. Chaudhuri, P.

531.38

318.46 Sharma, Kishori Lal. Elasticity. Delhi, Mathematics, 1963-67. Dhaliwal, R. C.

531.38

319.47 Tiwari, Giriraj. Effect of couple stresses in elastic continuum. Indore, Mathematics, 1965-67. Paria, Gunadhar, Professor of Mathematics, G. S. T. Institute, Indore.

Cosserat brothers established a very general theory of elasticity known as couple stress theory. In this theory, couple per unit area acting across a surface within a material volume or on its boundary, is taken into account in addition to the usual force per unit area. It is proposed to show the effect of couple-stresses on elastic stress distribution.

(1) Jour. Sci. Engg. Res. 9 ; 1965 : p. 30-38 ; and (2) Ind. Jour. Mech. Math. 4 ; 1966 : p. 56-66.

531.38

Friction

320.48 Kapur, Vijay Kumar. Lubrication of bearings in magnetic field. I.I.T., Kanpur, Mathematics, 1964-67. Kapur, Jagat Narain, Professor and Head of the Department.

A study of some aspects of different types of bearings using liquid metal as lubricant in the presence of magnetic field is being pursued.

531.4

Ballistics

321.49 Manak Singh. Rocket ballistics. Delhi, Mathematics, 1965-68. Varma, R. S., Dean, Faculty of Mathematics.

It is proposed to study stability problems and optimization problems in rocketry as also to investigate transfer trajectories.

531.55

322.50 Ray, Asim. On some ballistic problems. Calcutta, Physics, 1965-68. Independently.

531.55

323.51 Srivastava, Tribhuwan Nath. Optimization problems in rocket ballistics. Delhi, Mathematics, 1964-67. Varma, R. S., Dean, Faculty of Mathematics.

It is proposed to study optimization problems in rocketry for optimum staging of multistage rockets under various criteria e.g. minimizing fuel energy to attain maximum payload and all burnt velocity. Transfer trajectories with least fluid consumption and time of flight are also being investigated.

531.55

324.52 Srivastava, Virendra Kumar. Contributions to internal ballistics of guns and rockets. I. I. T., Kanpur, Mathematics, 1963-67. Kapur, Jagat Narain, Professor and Head of the Department.

531.55

Energetics

325.53 Appa Rao, Dusi Venkataramanamma. Theoretical physics. Banaras, Physics, 1966-67. Sah, P., Reader.

It is planned to study the potential energy curves, vibrational wave functions and the transition probabilities of some diatomic molecules.

531.642

326.54 Gupta, Narendra Pal. Lattice dynamics of solids. Banaras, Physics, 1965-67. B. Dayal, Professor and Head of the Department.

Theoretically sound exponential interatomic potential is chosen for the study of inert gas solids. The potential parameters of solidified neon, argon, krypton and xenon have been calculated after including the effect of zero-point vibrations by a method of iteration. Using these parameters, calculations of the phonon spectra, heat capacities, thermal expansion and compressibility of inert gas solids have been done.

531.642

Transport Phenomena in Solids

327.55 Sharma, Satish Kumar. Transport phenomena in solids. I. I. T., Delhi, Physics, 1966-68. Sodha, M. S., Professor.

Electron emission and recombination have been studied in negatively charged solid particles. Some transport coefficients in degenerate semiconductor have also been studied. The nonlinear and second order thermal diffusion in ionized gases has been investigated.

531.7

328.56 Srivastava, Mahesh Prasad. Study of transport properties. I. I. S., Bangalore, Applied Mathematics, 1965-68. Bhatnagar, P. L., Professor and Devanathan, C., Asstt. Professor.

The transport properties have been calculated using the semi-quantum potential which has been modified for the large and small distances of interactions. The expressions of transport coefficients have been obtained using the reconsidered B-G-K model. The effect of dependence of cross section on the relative velocity of interacting particles has also been taken into account.

531.7

Mechanics of Fluids

329.57 Agarwal, Satya Prakash. Fluid mechanics. B.I.T.S., Pilani, Mathematics, 1964-67. Jain, P. C., Head of the Department of Mathematics, I. I. T., Bombay.

532

330.58 Biswas, R.K. Fluid mechanics. Delhi, Mathematics, 1965-68. Srivastava, R. S.

532

331.59 Gupta, Krishan Chand. Fluid mechanics. Delhi, Mathematics, 1960-67. Jain, P. C.

532

332.60 Mehra, Bepin Behari. Superpossibility problems in fluid dynamics. Delhi, Mathematics, 1958-67. Kapur, Jagat Narain Professor and Head of the Department of Mathematics, I. I. T., Kanpur.

532.05

333.61 Raman, Laxmi. Relativistic fluid mechanics. I.I.T., Delhi, Mathematics, 1966-69. Saini, G. L., Asstt. Professor.

532

Hydrodynamics

334.62 Bansal, Jawahar Lal. A study of laminar viscous flow. Rajasthan, Mathematics, 1965-67. Verma, Purshottam Das, Reader.

The following laminar flow problems are under study : (a) Laminar flow through a uniform circular pipe with small suction ; (b) Forced convection in laminar flow between two parallel walls and in a circular pipe with suction ; and (c) Laminar flow in an annulus with porous walls of different permeability.

Flow of a viscous..............at the stationary plate. Proc. IAS. 64(A) ; Dec. '66 : p. 385-396.

532.515

335.63 Bhatia, Surendra Pal Singh. Studies in second order fluids. Roorkee, Mathematics, 1965-67. Sharma, S.K., Reader.

It is proposed to study some problems of flow of second order fluids. Apart from investigating the effects of errors in viscous and elastico-viscous forces in the flow, it is also proposed to study the interaction of magnetic field, when the fluid is electrically conducting. Heat transfer analysis is also under purview.

532.5

336.64 Bhatnagar, K. S. Theoretical studies of non-Newtonian fluids. I.I.S., Bangalore, Applied Mathematics, 1966-69. Bhatnagar, P. L., Professor.

Theoretical studies regarding non-Newtonian fluids characterised by Rivlin-Ericksen and Oldroyd's constitutive equation have been made and a problem has been worked out to study the nature of the secondary flow and temperature field due to a steadily rotating sphere under various types of thermal boundary conditions. Some distinctive features of non-Newtonian fluids have been observed which distinguished them from the usual Newtonian fluids.

532.5

337.65 Chatterjee, Arun Sankar. Heat transfer problems in fluid mechanics with or without the presence of electromagnetic field. I. I. T., Kharagpur, Mathematics, 1965-67. Gupta, A. S., Asstt. Professor.

Several hydrodynamic and hydromagnetic flow problems are being studied with special reference to the heat transfer characteristics of the flow. Effects of magnetic field on the flow and the heat transfer will also be investigated in detail.

532.5

338.66 Faruqi, Sadika. Fluid dynamics. Osmania, Mathematics, 1965-68. Lakshminarayana, G., Asstt. Professor.

The research is being done on non-Newtonian liquids, such as, blood, thick oils, paints, colloidal suspensions and high polymer solutions and highly viscous liquids. They exhibit certain type of phenomena which cannot be described by stress-strain velocity relations of the classical hydrodynamics. The rheological behaviour of the non-Newtonian liquids can be adequately studied by generalising the stress-strain velocity relations of the classical hydrodynamics in the manner suggested by Rivlin (1948) and Keiner (1952).

532.5

339.67 Geetha Bai, P. Hydrodynamics. Osmania, Mathematics, 1966-67. Teeka Rao, Reader.

532.5

340.68 Gulati, Shobha. Effects of rotation, magnetic field and heat transfer on fluid flows. I. I. T., Delhi, Mathematics, 1964-67. M. P. Singh, Asstt. Professor.

The following problems in fluid mechanics have been studied in detail : (1) Magnetic effects on elastico-viscous flow past a porous flat plate ; (2) Hydromagnetic flow between two oscillating flat plates ; (3) Steady flow, laminar flow and heat transfer of a viscous fluid through a porous tapered channel ; (4) Steady flow, laminar flow and heat transfer of a viscous fluid through a porous tapered tube ; (5) Rotatory oscillations of a sphere with variable normal suction or injection in a rotating fluid ; (6) Steady rotations of spheroid with slip in a conducting viscous fluid ; (7) Rotatory oscillations of a spheroid with slip in a conducting fluid ; and (8) Linear oscillations of a spheroid with slip in a conducting viscous fluid.

532.5

341.69 Gupta, Ramesh Chandra. Non-Newtonian fluid flow in the inlet region of pipes and channels. I. I. T., Kanpur, Mathematics, 1963-67. Kapur, Jagat Narain, Professor and Head of the Department.

532.54

342.70 Kalthia, N. L. Study of jet flows of different non-Newtonian fluids. Gujarat, Mathematics, 1965-68. Vaidya, P. C., Profesor and Head of the Department.

An attempt is being made to study the jet flows of different fluids, such as, power law fluids, Bingham fluids and other non-Newtonian fluids. It is also proposed to discuss these flows under different conditions, such as, (i) moving medium (ii) under pressure (iii) magnetic effects etc.

532.5

343.71 Lajpat Rai. Hydrodynamic stability. I. I. T., Kharagpur, Mathematics, 1965-67. Gupta, A. S., Asstt. Professor.

Some problems of linear stability theory in hydrodynamics and hydromagnetics are being investigated to study the influence of visco-elasticity, magnetic field and various diffusivities on the stability characteristics of flows.

532.5

344.72 Mathur, Mukund Narain. Heat transfer and secondary flows in some non-Newtonian elastic fluids. I. I. S., Bangalore, Applied Mathematics, 1964-67. Bhatnagar, P. L., Professor.

The heat transfer problems in steady flows of Rivlin, Erickson and Oldroyd fluids have been investigated under different conditions, such as, between two wavy walls, in a wavy cylindrical tube and between two cylinders, when (i) both the boundaries are at constant but different temperatures and (ii) one boundary is at constant temperature and the other non-conducting. Secondary flows of Walter's fluids between two rotating spheres, and due to oscillations of a sphere are also being studied.

Jour. IIS. 48(1) ; 1966.

532.5

345.73 Narasimham, K. L. Fluid dynamics. Osmania, Mathematics, 1965-67. Teeka Rao, Reader.

Different aspects of fluid dynamics, like compressible flow theory, boundary layer theory, aerodynamics, magneto gas and hydrodynamics are proposed to be studied.

532.5

346.74 Pandey, B. C. Fluid mechanics. I.I.S., Bangalore, Applied Mathematics, 1966-68. Bhatnagar, P. L., Professor and Jain, A. C., Asstt. Professor.

The effect of the variation of fluid properties on the boundary layer solutions has been considered within the framework of similar solutions by splitting the steam function and temperature function into sets of universal functions which are under computation. Some flow problems using full Navier-Stokes equations are under investigation.

532.5

347.75 Prabhamani, K. Fluid mechanics. I. I. S., Bangalore, Applied Mathematics, 1966-69. Jain, A. C., Asstt. Professor.

Hypersonic flow around blunt bodies at low Reynolds number and perturbation solution of the laminar compressible boundary layer are being studied.

532.5

348.76 *Rajagopalan, Renuka. Theoretical studies in non-Newtonian fluids.* I. I. S., Bangalore, Applied Mathematics, 1965-68. Bhatnagar, P. L., Professor.

The research includes the study of the secondary flow field of general non-Newtonian fluids when the confining boundaries are subject to oscillatory and rotatory motions. It also includes the study of the nature of micropolar fluids and their flow behaviour.

532.5

349.77 Rajvanshi, Satish Chandra. Some flow problems in non-Newtonian fluids. Rajasthan, Mathematics, 1965-67. Verma, Purshottam Das, Reader.

A detailed study has been undertaken of the following flow problems : (1) The steady motion of Reiner-Philippoff and Ellis fluids in an annulus under toroidal pressure gradient ; (2) The steady flow of Reiner-Philippoff fluid between parallel plates and coaxial cylinders in linear movement ; (3) Torsional oscillations of a plane in viscoelastic Maxwell fluid ; (4) Flow of viscoelastic Maxwell fluid between torsionally oscillating discs ; and (5) Steady laminar flow of viscoelastic fluid through parallel and uniformly porous walls of different permeability.

532.5

350.78 Saroa, M. S. Second order fluids. I. I. T., Kharagpur, Mathematics, 1965-67. Srivastava, A.C., Asstt. Professor.

Certain unsteady and steady flow problems are being studied taking the constitutive equation for an incompressible second order fluid.

532.5

351.79 Savithri, P. G. Fluid mechanics. I.I.S., Bangalore, Applied Mathematics, 1966-68. Bhatnagar, P. L., Professor.

The mechanics of rotating fluid are being studied with special reference to ocean circulation.

532.5

352.80 Shah, Yashodhara P. Gravitational collapse. Gujarat, Mathematics, 1965-69. Vaidya, P. C., Professor and Head of the Department.

A model of a charged fluid sphere undergoing gravitational contraction has been constructed on the lines of the Oppenheimer-Snyder model of uncharged collapsing sphere. From the study of this model, the line-element to describe the gravitational field of a charged praticle embedded in an expanding universe has been investigated. Further work is in progress.

Curr. Sci. 36(5) ; 1967.

532.5

353.81 Shakuntala, V. Fluid dynamics : Non-Newtonian flows. Osmania, Mathematics, 1965-68. Teeka Rao, Reader.

It is proposed to study the flows of non-Newtonian fluids through (i) pipes of various cross sections under a periodic pressure gradient ; (ii) a circular tube ; (iii) a rectangular pipe ; and (iv) between parallel plates. Unsteady flow of viscoelastic fluids in a circular piper, a rectangular piper and a pipe of any other cross-section will also be studied.

532.54

354.82 Sharma, Hari Gopal. Studies of some flow problems in second order fluids. Roorkee, Mathematics, 1963-66. Sharma, S. K., Reader.

(1) Flow of second order fluid over an enclosed rotating disk. ASR. 15(1) ; (2) Steady motion of a second order fluid past a circular cylinder and between two coatial circular cylinder with suction and injection. Jour. Phys. Soc. Japan. 21(1) ; 1966 : p. 173-176 ; and (3) Flow of second order fluid near a rotating plate. Roorkee Uni. Res. Jour. 1966 : p. 21-36.

532.5

355.83 Solomon, H. Some studies of flow of non-Newtonian fluids. I. I. S., Bangalore, Applied Mathematics, 1966-69. Bhatnagar, P. L., Professor and Bhatnagar, R. K.

Some studies on Rivlin-Ericksen, Oldroyd and Walter's fluids have been completed. A secondary flow problem has been worked out to study the nature of flow of these fluids between two steadily rotating cones, having an arbitrary gap angle between them, when the cones rotate in the same or opposite directions or one of them is held at rest.

532.5

356.84 Srivastava, Ramesh Chandra. Non-Newtonian fluid flows. I. I. T., Kanpur, Mathematics, 1961-67. Kapur, Jagat Narain, Professor and Head of the Department.

(1) Similar solutions of the boundary layer equations for power-law fluids. (with J.N. Kapur). ZAMP. 14(4); 1963 ; (2) Axially-symmetric and two dimensional stagnation point flows of a certain viscoelastic fluid. (with J. N. Kapur). Jour. Phys. Soc. Japan. 18(3) ; 1963 ; (3) On steady motion of a viscoelastic liquid between two plane boundaries or in an annulus with and without suction. (with J. N. Kapur). Jour. Sci. Engg. Res. 7(1) ; 1963 ; (4) Boundary layer velocity profiles for the flow of power law fluids in the inlet length of a circular

pipe. (with J. N. Kapur). Maths. Seminar. 3 (1 & 2); Jan. and April'63 : p. 21-27 ; (5) A note on impossibility of some flows for general Reiner-Rivlin fluids. (with J. N. Kapur). ibid. 14(1) ; 1966 : p. 38-45 ; (6) Similar solutions of boundary layer equations for powerlaw fluids. with (J. N. Kapur). A. I. Ch. E. Jour. 10(5) ; Sept.'64 : p. 775 ; (7) Hydrodynamic lubrication of an externally pressurised bearing using a Reiner-Rivlin lubricant. ASR. 14(A) ; 1965 : p. 133-137 ; and (8) Steam line flow through a curved annulus. (with J. N. Kapur and V.P. Tyagi). ibid. 14(A) ; 1965 : p. 253-267.

532.5

357.85 Subba Raju, P. V. Fluid mechanics. I. I. T., Kharagpur, Mathematics, 1965-67. Balram, M., Lecturer.

The effects of magnetic field and elasticity on certain rotationally symmetric flows are being studied.

532.5

358.86 Subramanyam, Somenahalli Venkatesa. Flow of fluids. I.I.S., Bangalore, Physics, 1965-68. Raja Gopal, E. S., Asstt. Professor.

Some theoretical investigations of the mechanism of emulsification have been undertaken as they are important in practice. The role of interfacial tension and viscosity and that of surface tension gradients is being studied. The study of stability and oscillations of a liquid drop in a fluid medium has also been undertaken.

532.5

359.87 Tikekar, Vasant Gajanan. Fluid mechanics. I.I.S., Bangalore, Applied Mathematics, 1962-67. Bhatnagar, P. L., Professor and Head of the Department.

The investigation relates to the characterisation of the flows with heat transfer in the case of plane and cylindrical geometries for Newtonian and non-Newtonian fluids.

(1) Proc. CPS. 62 ; 1966 : p. 301-302; and (2) Jour. IIS. 49(1) ; 1967 : p. 1-9.

532.5

360.88 Udaya Shanker, M. Fluid mechanics. I.I.T., Kharagpur, Mathematics, 1966-68. Agarwal, J. P., Lecturer.

Some steady and unsteady flow problems with and without heat transfer have been studied.

532.5

361.89 Verma, R. L. Hydrodynamic lubrication. I.I.T., Kharagpur, Mathematics, 1966-68. Agarwal, J. P., Lecturer.

Certain problems of hydrodynamic lubrication with suction or injection are being investigated in the light of inertia forces in magnetic field.

532.5

362.90 Yash Paul. Some problems in statistical theory of turbulence. I. I. T., Delhi, Mathematics, 1964-67. Prem Kumar, Lecturer.

The problems of the reactant and product of reaction concentration in turbulent mixing fluids are being studied.

532.517

Viscosity

363.91 Chadha, T. Hydrodynamic flow problems in thermoviscous fluids. I.I.T., Delhi, Mathematics, 1966-68. Jain, M. K., Professor and Head of the Department.

A study is being made of the following problems on flow and heat transfer in thermoviscous fluids : (a) From a rotating disk ; (b) About a rotating cone ; (c) When an infinite plate is torsionally oscillating ; (d) About an axially symmetric stagnation point (steady case) ; (e) Past an unsteady stagnation point ; (f) Between two infinite slowly rotating disks ; and (g) Between an unsteady rotating infinite disk and rotationary infinite disk.

532.58

364.92 Das, Upendra Nath. Some flow problems on elastico-viscous fluids. I.I.T., Kharagpur, Mathematics, 1966-68. Balram, M., Lecturer.

Using Oldroyd's model (1958) of constitutive equations, the problem of flow between two rotating disks is being investigated.

532.58

365.93 Ghosh, Arun Kumar. Problems of viscous and viscoelastic fluids. Visva Bharati, Mathematics, 1965-67. Sen, B., Professor.

The work has been taken up to find solutions of problems of flow of viscous and viscoelastic fluids. As regards the flow set up in a liquid contained between two cylinders due to longitudinal and rotational motion of the cylinders has been considered. The temperature distribution in viscous liquid has also been obtained in several problems. Amongst viscoelastic fluids, attention has been paid to the study of problems on laminar and rotational motion of Maxwell and Linear viscoelastic fluids.

532.58

366.94 Ghosh, Robin. Studies on the viscosity and allied properties of the liquids. North Bengal, Physics, 1964-67. Sen, S. N., Professor and Head of the Department.

The nature of the internal friction and the intermolecular force is closely related to viscosity. This mechanical property is influenced by external perturbing forces, such as, electric and magnetic fields. This interaction force with the liquid molecules may give some idea of liquid structure. The allied properties will also be studied and a consistent theory built up.

532.58

367.95 Gulati, S. P. Flow problems in elastico-viscous fluids. I.I.T., Delhi, Mathematics, 1964-67. Jain, M. K., Professor and Head of the Department.

The following problems are proposed to be studied: (1) Free convection elastico-viscous flow; (2) Generalised Couette type elastico-viscous flow ; (3) Elastico-viscous flow near a plate and between two plates executing linear oscillations under a uniform transverse magnetic field ; (4) Torsional oscillations of an infinite disc in an elastico-viscous fluid ; (5) Rotatory and linear oscillations of a sphere in and around an elastico-viscous fluid ; (6) Decay of motion of an elastico-viscous fluid; and (7) Propagation of sound waves in an elastico-viscous medium.

532.58

368.96 Gupta, Raj Kumar. Some flow problems in non-Newtonian fluids. Roorkee, Mathematics, 1963-66. Sharma, S. K., Reader.

Some flow problems in elastico-viscous liquids due to J. G. Oldroyd and second order fluids due to W. Noll and B. D. Colemana, have been investigated. Cases of physical interage have also been considered.

(1) Advance on out of second order fluid over an infinite flat plate. Jour. Phys. Soc. Japan. April '66 ; and (2) Effects of injection on the flow between infinite rotating discs. Roorkee Uni. Res. Jour. 1966.

532.58

369.97 Katyal, K.N. Fluid mechanics, I.I.T., Kharagpur, Mathematics, 1964-67. Nanda, R.S., Asstt. Professor.

Some steady and unsteady flow problems of visco-elastic non-Newtonian fluids are being investigated.

532.58

370.98 Nagraj, Durbaka. Viscoelastic fluid flows. I.I.T., Kanpur, Mathematics, 1963-67. Kapur, Jagat Narain, Professor and Head of the Department and Srivastava, Paras Nath, Lecturer.

532.58

371.99 Palekar, Manohar Ganpati. Flow of viscoelastic non-Newtonian fluids. I. I. T., Bombay, Mathematics, 1964-67. Kulshrestha, P. K., Asstt. Professor.

Some problems on non-Newtonian, visco-elastic, axisymmetric fluid flows, based on Reiner-Rivlin and

Langlois Models, with and without magnetic effect, have been solved.

532.58

372.100 Punyatma Singh. Fluid mechanics. I.I.T., Kharagpur, Mathematics, 1965-67. Nanda, R.S., Assst. Professor.

Some problems on viscous flows with heat transfer have been considered. The effects of applied magnetic field on velocity and temperature fields have been investigated. The effect of buoyancy forces on oscillatory flows is under investigation.

532.58

373.101 Rauthan, D. B. Elastico-viscous fluids. I.I.T., Kharagpur, Mathematics, 1965-67. Srivastava, A.C., Asstt. Professor.

Certain steady and unsteady flow problems are being studied, using the Oldroyd's constitutive equation for an elastico-viscous liquid.

532.58

374.102 Samavedam, Vijaya Lakshmi. Flow at small Reynolds numbers. I.I.T., Madras, Mathematics, 1964-67. Nigam, Swami Dayal, Professor.

The creeping motion of a viscous incompressible liquid in the half plane X70 for an arbitrary given velocity field in the plane X=0 is a subject of considerable interest. Recently some work on this problem has been done by Forste, Parmet and Saibel, and Viviand and Berger. The problem has been solved for wake and get type of flows in the two dimensional case and in the axisymmetric case. The present work is devoted to find a solution for asymmetric case which has remained unsolved so far.

532.58

375.103 Sen Gupta, Kiranmoy. Problems of flow of inviscid fluids. Visva-Bharati, Mathematics, 1964-67. Sen, B., Professor.

Several problems of flow of perfect fluids due to sources and sinks in the presence of solids of revolution have been investigated. Research on the effect of rotation of spindles and other solids in the viscous fluids has been carried out.

532.58

376.104 Sinha, Prakash Chandra. Viscous incompressible fluid flows with heat transfer. I.I.T., Kharagpur, Mathematics, 1966-68. Rao, A. K., Lecturer.

A problem on hydrodynamic free convection flow from a vertical flat plate is being studied.

532.58

377.105 Bhaumik, Sites Bhusan. Cavitation in hydrodynamics. I.I.T., Kharagpur, Naval Architecture, 1959-68. Nigam, S. D., Professor and Head of the Department of Mathematics, I. I. T., Madras.

The geometric properties of the cavity generated by the class of two and three dimensional bodies, both in symmetric and asymmetric flows, have been studied and attempts are being made to develop a theory for the same.

Jour. Sci. Engg. Res. 8(1); 1964 : p. 157-162.

532.595

378.106 Malik, Shemer Chand. Study of non-Newtonian and shock waves by tensors. Delhi, Mathematics, 1961-67. Singhal, M. K., Reader.

532.595

379.107 Raman, S. V. Study of solitary waves in fluid dynamics. I.I.T., Kharagpur, Mathematics, 1966-68. Kaul, C. N., Asstt. Professor.

Some problems of solitary waves in compressible and incompressible media are under study. An attempt is being made to extend this wave phenomena to magneto fluid dynamics.

532.593

Mechanics of Gases

Transport Phenomena

380.108 Dasgupta, Amalendu. Thermal conductivity and other transport properties of gases. Calcutta, Physics, 1962-67. Srivastava, B. N.

533.13

381.109 Deb, Subhendu Kumar. Studies on thermal diffusion in gases and other related phenomena. Calcutta, Physics, 1964-68. Barua, A. K., Reader, General Physics, Indian Association for Cultivation of Science, Calcutta.

533.13

382.110 Gupta, Girraj Prasad. Studies on thermal conductivity and other properties of gases. Rajasthan, Physics, 1965-68. Gandhi, J. M., Lecturer.

It is proposed to measure thermal conductivity as a function of temperature of pure gases and multicomponent gas mixtures of varying composition by three different units, two of which have been set up and the third will be set up. The experimental data thus produced will be employed to check the various theories of thermal conduction. Relevant theoretical studies of other transport properties will also be made.

533.13

383.111 Mukhopadhyay, Partasarathy. Transport properties of gases. Calcutta, Physics, 1964-68. Barua, A.K., Reader, General Physics, Indian Association for Cultivation of Science, Calcutta.

533.13

384.112 Nain, Vijay Pal Singh. Certain properties of gases. Rajasthan, Physics, 1965-67. Saxena, S. C., Reader.

The work is being done on diffusion and thermal diffusion phenomenon in stable and radioactive gas mixtures on the one hand and intermolecular forces (theoretical) on the other.

533.13

385.113 Raydastidar, Tusharkumar. Transport properties of chemicals reacting gas systems. Calcutta, Physics, 1964-67. Barua, A.K., Reader, General Physics, Indian Association for Cultivation of Science, Calcutta.

533.13

386.114 Saxena, Vinod Kumar. Studies on the transport properties of gases. Rajasthan, Physics, 1964-67. Saxena, S. C., Reader.

Out of all the transport properties of gases, the phenomena of thermal diffusion and thermal conductivity have been particularly studied. The thermal diffusion columns and trennschaukel have been exploited and the behaviour of thermal diffusion columns has been particularly studied for isotopic as well as non-isotopic gas mixtures. The most important application of thermal diffusion columns for the determination of thermal conductivity of pure gases has been studied in detail and the measurements have been extended to 1500°K.

Ind. Jour. Tech. 4(8) ; 1966 : p. 227-230.

533.13

387.115 Tondon, Prahlad Kumar. Studies on non-equilibrium properties of gases. Rajasthan, Physics, 1965-67. Saksena, M. P., Lecturer.

It is proposed to study theoretically non-equilibrium properties of gases with special reference to thermal conductivity of gases. An apparatus has been set up for measuring thermal conductivity of gases from cryogenic to about 300°C temperatures.

533.13

Dynamics

388.116 Jain, Sant Kumar. Unsteady flow of gases through porous medium. Indore, Mathematics, 1966-68. Paria, Gunadhar, Professor of Mathematics, G. S. T. Institute, Indore.

In case of unsteady flow of gases through porous medium, the fundamental differential equation becomes nonlinear. Consequently, in special problems analytical solutions have not been obtained in most cases. It is proposed to investigate the unsteady flow of gases through porous medium by analytical methods.

533.295

389.117 Phoolan Prasad. Waves of finite amplitude : Shock waves and radiation gas dynamics. I.I.S., Bangalore, Applied Mathematics, 1965-68. Bhatnagar, P. L., Professor.

A study of finite amplitude waves has been undertaken with special reference to : (i) The formulation of a numerical procedure for shock problem using artificial heat conduction ; (ii) Effect of radiation on the structure of a plane stationary shock ; (iii) One dimensional small amplitude waves in radiation gas dynamics ; (iv) Nonlinear waves in radiation gas dynamics ; (v) Shock tube problem and point explosion problem by method as developed in (i) ; and (vi) Weak blast wave in water.

533.295

390.118 Somasekhara Sastry, Mudagundur. Some aspects of hypersonic flows. I.I.T., Kanpur, Mathematics, 1962-67. Kapur, Jagat Narain, Professor and Head of the Department.

533.276

391.119 Varma, R. K. Some problems in radiation gas dynamics. Delhi, Mathematics, 1964-67. Murgai, M. P.

533.2

Aeromechanics

392.120 Bhatnagar, K. B. Space dynamics. Delhi, Mathematics, 1964-67. Varma, R. S., Dean, Faculty of Mathematics.

533.62

393.121 Biswas, Ramendra Kumar. On some problems of interaction of shock waves. Delhi, Mathematics, 1965-68. Srivastava, R. S., Senior Scientific Officer (I), Defence Science Laboratory, Delhi.

The interaction of shock waves—normal, oblique and curved—with rigid walls of various shapes and with another shock is being studied. The object is to find out theoretically the shape and strength of these waves and the change in their physical properties after the interaction.

533.6295

394.122 Chopra, M. G. Some problems of interaction of shock waves. Delhi, Mathematics, 1965-67. Srivastava, R.S., Senior Scientific Officer (I), Defence Science Laboratory, Delhi.

The following problems on shock waves are being studied : (1) Interaction of oblique blasts with yawed wedges ; (2) Propagation of m.h.d. cylindrical shocks ; and (3) Reflection of normal and oblique shocks from rigid boundaries in a fermidirac gas.

Interaction of oblique blast. Def. Sci. Jour. Oct. '66.

533.6295

395.123 Gadgil, Shashank Shripad. Propagation of shock waves in solids. I.I.T., Delhi, Mechanical Engineering, 1966-69. Moore, N.P.M., Professor and Head of the Department.

The stress waves will be produced by the impact excitation on a viscoelastic material e.g. plastic. The excitation will be controlled as regards magnitude and duration of the impact. The effect of this impact on the material will be studied by experimental investigation of the propagation of the stress waves produced.

533.6295

396.124 Gaur, Ravindra Kumar. A study of the 'Isobar Model'. Kurukshetra, Physics, 1966-69. Sharma, A. P., Reader.

533.8

397.125 Gupta, Lakshmi Narayan. Boundary value problems and their investigation. I.I.T., Kanpur, Mathematics, 1964-67. Bhargava, Rajeshwar Dayal, Professor.

533.627

398.126 Kundu, Pijush Kanti. Interaction of a vortex and a plane travelling shock wave. I.I.T., Delhi, Applied Mechanics & Mechanical Engineering, 1966-69. Malhotra, R. C. Assoc. Professor.

A vortex will be generated by the passage of a plane shock front over an airfoil mounted in a shock tube. The interaction of the reflected shock wave with the starting vortex will be studied, both analytically and experimentally.

533.6295

399.127 Nanda, K. D. Non-equilibrium flows. I. I. T., Kharagpur, Mathematics, 1964-67. Bhutani, O. P., Lecturer.

A general theory of thin airfoil in non-equilibrium magnetogasdynamics has been developed. Non-equilibrium flow past an oscillating airfoil in a wind tunnel is being studied. Flow past an infinite corrugated cylinder and stability of inviscid jets in non-equilibrium gas dynamics will also be investigated.

533.62

400.128 Parihar, Kailash Singh. Investigation on boundary value problems. I. I. T., Kanpur, Mathematics, 1964-68. Bhargava, Rajeshwar Dayal, Professor and Srivastav, Ram Prasad, Asst. Professor.

533.627

401.129 Ramachandran, Sundaram. Response characteristics of anemometers. Poona, Physics, 1963-66. Pisharoty, P.R., Director, Institute of Tropical Meteorology, Poona.

The nonlinearities in the response characteristics of meteorological anemometers have not been studied so far. A nonlinear theory has been developed for these anemometers, and verified for the steady state response inside the wind tunnel with the available experimental data. The theory reveals large attenuation in the amplitudes of indicated fluctuations of natural gusts and a large exaggeration in their mean values. A method of compensation for these characteristics has been worked out and demonstrated.

533.8

For Applied Mechanics

See

ENGINEERING MECHANICS AND MATERIALS

Sound

Propagation

402.130 Arora, Jhangi Ram. Elastic waves : Seismology. Kurukshetra, Mathematics, 1964-68. Chopra, Som Datt, Professor and Head of the Department.

The problem of improvement in signal to noise ratio through the use of arrays of seismometers is being considered in order to detect and extract the seismic signals in presence of noise.

534.205

403.131 Bhatnagar, Satish Chandra. Elastic waves propagation. Kurukshetra, Mathematics, 1965-67. Chopra, Som Datt, Professor and Head of the Department.

534.205

404.132 Kehar Singh. Elastic waves layered in homogeneous media. Kurukshetra, Mathematics, 1962-68. Chopra, Som Datt, Professor and Head of the Department.

Propagation of elastic waves in a layer between two homogeneous half spaces with special reference to seismology is under study.

534.205

405.133 Mukherjee, Sunita. Vibrations and propagation of elastic waves in continuous media. Visva-Bharati, Mathematics, 1966-68. Sen, B., Professor.

The research comprises the study of disturbances due to a ring load sliding over the rough surface of an infinite cylindrical rod, and the dynamical response of non-isotropic infinite plate to impulsive loading. In the study of disturbances, expression has been found for radial and tangential displacements in the case of symmetry, and the superposition of the effect of normal pressure and frictional force has been discussed. In the case of dynamical response, exact solution for the displacement of a homogeneous non-isotropic infinite plate due to the application, at origin, of a concentrated force, normal to the surface, has been found with the help of both the Hankel and Laplace transform methods. Numerical calculation for the maximum displacement has also been made.

534.205

406.134 Parameswara Iyer, Bhamambal. Studies in solvent effects. Kerala, Physics, 1964-67. Venkateswarlu, K., Professor and Head of the Department.

The ultrasonic velocities, adiabatic compressibilities as also magnetic susceptibilities in some binary organic liquid mixtures have been measured. Spectroscopic studies of solvent effect are also being made.

534.23

407.135 P. Avtar. Elastic waves : Seismology. Kurukshetra, Mathematics, 1962-66. Chopra, Som Datt, Professor and Head of the Department.

The problem of propagation of Love Waves in a media with two layered homogeneous isotropic crust overlying a vertically inhomogeneous half space is being investigated.

534.205

408.136 Sidhu, Ranbir Singh. Elastic waves with special reference to seismology. Kurukshetra, Mathematics, 1967-69. Chopra, Som Datt, Professor and Head of the Department.

534.205

409.137 Tarkeshwar Lal. Theoretical studies on propagation of elastic waves in stratified media. Banaras, Geophysics, 1965-67. Rathor, H. S., Head of the Department.

Elastic wave problems assume homogenity, perfect elasticity, parallel plane boundaries and isotropy. In practice, ambiguities do exist between theory and observation and, therefore, the problem has been reformulated under less restrictive conditions dropping the assumption of strict isotropy. The work on seismic surface waves is in progress.

534.205

410.138 Upadhyay, Shri Kant. Theoretical studies on seismic surface wave dispersion. Banaras, Geophysics, 1965-67. Rathor, H. S., Head of the Department.

Studies of surface wave dispersion have been done taking several theoretical models. The effect of inhomogeneity and anisotropy on dispersion of seismic surface waves has been studied. Different types of mathematical representations for different layering conditions have also been studied.

534.205

411.139 Usha. Elastic waves. Kurukshetra, Mathematics, 1966-68. Chopra, Som Datt, Professor and Head of the Department.

534.206

Characteristics

412.140 Agarwal, Shyam Sunder. Electronic identification of Hindi speech. Aligarh, Physics, 1965-68. Rais Ahmed, Professor and Head of the Department.

Basic work on acoustic properties of Hindi sounds will be done and this information will be used to make a programme for identification.

534.3

413.141 Gupta, Jagdish Prashad. Study of amplitude-dichotomized waves of vowel sounds. Aligarh, Physics, 1965-68. Rais Ahmed, Professor and Head of the Department.

It is proposed to measure zero crossing intervals in clipped speech so as to study the inner structure for speech recognition clues.

534.34

Analysis

414.142 Basu, Sanat Kumar. Study of a flow-graph model of programming languages. Bombay, Tata Institute of Fundamental Research, Bombay, 1964-66. Thosar, B. V., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

A PLS is a meta-meta theoretic characterization of programming languages. By fixing the constituent parameters, two models viz. SPL model and HPL model have been derived. The reduction process over a finite set of structures in SPL model has been studied. The SPL model is shown to be adequate by study of the computation process in it. The $F_G(s)$ and $_L$ algorithms for HPL model have been developed. Semantics of label evaluation in an environment have also been discussed.

534.46

415.143 Sarva Jit Singh. On the disturbance due to a point source in a layer overlying a semi-infinite solid. Kurukshetra, Mathematics, 1963-66. Chopra, Som Datt, Professor and Head of the Department.

The problem of a point source situated in a layer overlying a semi-infinite solid is being discussed. Bromwich expansion of the displacement potentials has been obtained. The integrals have been evaluated approximately along the Sommerfeld contour. Theoretical seismograms for the displacements at any point on the free surface have also been obtained.

534.46

Ultrasonic Vibrations

416.144 Edkie, Rama Ganesh. Propagation of ultrasonic waves in solids and liquids. Nagpur, Physics, 1966-68. Khare, P. L., Reader.

With improved experimental techniques, it is proposed to investigate the compressibilities of electrolytic solutions at extremely low concentrations and analyse existing theories. It is also intended to determine elastic constants and study interatomic forces in case of certain crystals. A specially designed pulse generator, R. F. oscillator and pulse modulator to work in the 15-20 Mc/s range have been built. Other electronic units required for the experimental set up are being assembled.

534.55

417.145 Prabhavathi, Kasarabada Lakshmi. Studies in ultrasonics. Venkateswara, Physics, 1964-67. Bhimasenachar, J., Professor.

Ultrasonic pulse technique is being developed in order to study the ultrasonic absorption in liquid mixtures to understand the intermolecular interactions.

534.55

418.146 Raghunath, Kalyandrug. Studies in ultrasonics. Venkateswara, Physics, 1964-67. Subrahmanyam, S.V., Reader.

Excess thermodynamic properties in organic liquid mixtures are being studied with a view to explain the mechanism of interaction among the different molecules.

534.55

419.147 Ramakant, Uttarwar Shreeniwas. Ultrasonics. I.I.S., Bangalore, Physics, 1963-67. Venkatasubramanian, V. S., Asstt. Professor.

The study of elastic wave propagation in anisotropic media, like crystals, reveals interesting features, such as, deviation of ray from wave normal conical refraction of quasi-transverse waves, depending on elastic constants and symmetry of the crystals. Using optical method, the extraordinary refraction of elastic waves has been studied for several crystals belonging to different crystal systems.

Jour. Acoust. Soc. America. 39 ; 1966 : p. 1190

534.55

420.148 Venkateshwarlu, Maddhi. Ultrasonic relaxation in liquids. Osmania, Physics, 1964-67. Sivarama Sastry, G., Lecturer.

Studies on ultrasonic relaxation in liquids have been undertaken using pulse method. Electronic accessories to cover a frequency range of 1 to 50 Mc/s have been designed and constructed. A mechanical arrangement useful at different temperatures and with conducting liquids is nearing completion. Work on some organic liquids that exhibit thermal and structural relaxation will also be done.

534.55

421.149 Viswanath Reddy, Yerramreddi. Ultrasonics. Venkateswara, Physics, 1965-68. Subrahmanyam, S. V., Reader.

An attempt is being made to set the pulsed ultrasonic interferometer and study the absorption of ultrasonic waves in liquids and solids.

534.55

Light

Transmission

422.150 Chaudhuri, Manas Kumar. Absorption and fluorescence. Calcutta, Physics, 1959-67. Ganguli, S. C., Reader, Physics, Jadavpur University.

535.3

Refraction

423.151 Chaudhari, R. N. Optical and interferometric studies of some alkali halide single crystals. Patel, Physics, 1965-68. Patel, A.R., Professor and Head of the Department.

Grain boundaries have been observed by etching and polishing the freshly matched cleavage surfaces of NaCl single crystals. Measurements have been made regarding the pit densities on the intersecting boundaries and the angle of the orientation of the grains has been calculated. Microdiscs have also been observed on both NaCl and KCl single crystals by etching. Growth of alkali halide crystals is in progress.

535.324

424.152 Kotru, Pushakarnath N. Optical and interferometric studies of dissolution features of quartz family minerals. Patel, Physics, 1965-68. Joshi, M. S., Reader.

A detailed survey of etch patterns obtained under various conditions of etching in the case of cleaved faces parallel to all possible directions, both in the case of natural and synthetic quartz, is proposed to be carried out. Etch patterns obtained under a variety of etching conditions will then be compared with growth features on habit faces of the two varieties of quartz. This is with a purpose to see whether, or not, the etch patterns unfold some mechanism of growth. The proposed study may also help indexing dislocations, glide plane stacking fault, impurities etc.

535.324

425.153 Mathai, K. John. Optical and interferometric studies on the etch patterns of mica and silicon carbide single crystals. Patel, Physics, 1965-68. Patel, A. R., Professor and Head of the Department.

The extension of line defects in mica crystals is being studied by trying to establish correspondence of etch patterns on the opposite faces of thin flakes of mica of different thicknesses. Radiation effect of thermal neutrons on mica is also under investigation by employing method of etching. So far no difference could be found in an irradiated mica flake from its match non-irradiated counterpart. The examination of natural basal planes of silicon carbide crystals obtained from different sources and the study of dislocation contents in them by chemical etching at high temperatures are also just started. Fractured cleavages are also being attempted.

535.324

426.154 Raju, K. S. Optical and interferometric studies on etch patterns of selenite crystals. Patel, Physics, 1964-67. Patel, A. R., Professor and Head of the Department.

Studies have been made of prism and rhombohedral cleavages and dislocation contents in cultured quartz by polishing and etching of thin flakes. A study of cleavages and dislocations has been made of (010) face of selenite by optical and interferometric methods. Parallel inclined dislocations, grain boundaries, stratigraphy and anomalous etch pits have also been recorded.

535.324

427.155 R. P. Singh. Dislocation study in barium fluoride crystals. Patel, Physics, 1966-68. Patel, A.R., Professor and Head of the Department.

Optical and interferometric studies on the (111) cleavage faces and etched cleavage faces of the barium fluoride single crystals are being made. Plane surfaces between the cleavage lines obtained on interferogram have been observed. Interferometric work on etched match faces and on a polished face is in progress. Equilateral triangular pits, observed on etched cleavage faces, reveal the emergence of dislocations. All pits are seen to be eccentric. Measurements to find out eccentricity and depth of the dislocation line in the crystal are being made.

535.324

Optical Instruments

428.156 Anil Kumar. Some investigations in instrumental and atmospheric optics. I. I. T., Delhi, Physics, 1965-67. Sodha, M. S., Professor.

Theory of image formation in homogeneous and stratified media has been studied. Some methods of optical measurement of atmospheric refraction and lapse rate of temperature have been investigated. Limit of resolution of dark and bright objects has been studied in high resolution image forming instruments.

535.33

429.157 Rajagopala Rao, Patnayakuni. Study of chromatic and monochromatic abberation of optical systems in relation to instrument design and development. Vikram, Physics, 1965-69. Gogate, D. V., Professor.

535.33

Luminescence, Fluorescence & Phosphorescence.

430.158 Amar Singh. Luminescence. Gorakhpur, Physics, 1964-67. Sharma, D., Professor and Head of the Department.

By studying the phosphorescence decay of some alkaline earth sulphide phosphors, the trap depth and decay constant have been calculated. Again the trap depth and escape of frequency will be calculated by the study of thermoluminescence of the same phosphors. These results verify that in both cases monomolecular mechanism holds good.

535.35

431.159 Moonis Ali. Pattern recognition using adaptive threshold. Aligarh, Physics, 1966-69. Rais Ahmad, Professor and Head of the Department.

535.35

432.160 Vij, Des Raj. Thermoluminescence study of sulphide phosphors. Kurukshetra, Physics, 1965-68. Mathur, V. K., Lecturer.

Studies of thermoluminescence of sulphide phosphors in powder form, activated by rare earth elements excited by ultraviolet rays have been carried out at different rates of heating and trap depth has been calculated. Induced conductivity in these phosphor powders is also being studied.

535.35

Beams & their modification

433.161 Mahant, Rangachary. Study of Cerenkov radiations in gases, liquids and solids. Indore, Physics, 1964-68. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G. S. T. Institute, Indore.

The problem is connected with production and detection of Cerenkov radiations in gases at high pressures. Such system will be extensively studied with respect to fluorescence and Landau energy loss for its use in the determination of absolute energy of electrons. Gases used are CO_2, O_2 and n-butane. A study will also be made of the intensity of radiations (Cerenkov) vs. polarisation of electrons for plastic (Lucite) detectors.

535.58

434.162 Mukherjee, Bishnu Charan. Polarisation of electronic spectra of aromatic single crystals. *D. Sc.* Jadavpur, Physics, 1960-67. Ganguly, S. C., Reader.

From the study of polarisation of absorption and fluorescence spectra of different substances, both at room and low (-180°C) temperature, information about the direction of transition moment of the molecule in the crystals, energy levels, intensity and shape of the bands, fluorescence site etc., has been obtained.

535.52

435.163 Rama Murthy, Vedam. Studies in molecular polarisability of some organic molecules. Venkateswara, Physics, 1964-67. Purnachandra Rao, B., Lecturer.

The aim of the work is to specify the molecular polarisability ellipsoid of a molecule leading to the study of its stereostructure. Experimental techniques that are generally adopted in these studies are the scattering of light, molecular refractivity and Kerr effect. Attempts are now in progress to substitute Faraday effect for the Kerr effect. Efforts are also being made to correlate the ellipsoid constants with the molecular parameters, like bond force constants, mean amplitudes of vibration of the molecule etc.

535.52

Colour

436.164 Mukherjee, Mohan Lal. Studies in colour centres. I.I.T., Kharagpur, Physics & Meteorology, 1962-67. Bose, H. N., Professor and Head of the Department.

The effect of anionic impurities in the production of colour centres in potassium chloride single crystals is being studied.

Non-radiative destruction of F- centres in x-ray irradiated KCl doped with anionic impurities. Phys. Stat. Sol. 16 ; 1966 : p. 591.

535.6

Spectroscopy

437.165 Ansari, Babu Jan. Studies in absorption and fluorescence spectra. Gorakhpur, Physics, 1964-68. Sharma, D., Professor and Head of the Department.

The electronic and vibrational spectra of some di-substituted benzene derivatives, particularly substituted styrenes, have been studied and their detailed investigation is in progress.

535.84

438.166 Baruah, Gaurangadhar. Spectroscopic investigation in any wavelength. Banaras, Spectroscopy, 1966-68. R. S. Singh, Reader.

A theoretical approach has been undertaken to study the nature of the emission spectra of quinones. The G matrix calculations for anthraquinone are in progress. The emission spectra of hydroxy derivatives of anthraquinone is also being studied to determine the perturbation caused by the-OH substitution in side rings of the molecule.

535.84

439.167 Chakravarthy Ahobalachary, Indira. Vibration spectra and normal vibrations of molecules. Osmania, Physics, 1965-68. Venkata Ramiah, Kailasa, Reader.

The research is concerned with normal vibrations of molecules containing nitrogen and sulphur atoms. These molecules have a low symmetry and hence the numerical computations for solving secular equations involve the use of computer. The aim of the research is to assign the fundamental frequencies of polyatomic molecules on a quantitative basis.

535.84

440.168 Chaudhry, Ashok Kumar. Studies on the spectra of diatomic molecules. Banaras, Spectroscopy, 1966-68. Upadhyaya, K. N., Lecturer.

The A-X system of CP has been excited and recorded in 1.5 meter Bausch and Lomb grating spectrograph. Attempts are being made to photograph them under higher resolution and dispersion.

535.84

441.169 Doraiswami, Sadasivan. Rotational spectra of gases. Bombay, Atomic Energy Establishment, Trombay, 1964-68. Narasimham, N. A., Head of the Spectroscopy Division, Atomic Energy Establishment, Trombay.

A 100 Kc/s stark modulated microwave spectrometer for the analysis of the rotational spectra of gases has been completed. The sensitivity of the spectrometer has been tested by using methyl alcohol and lines of intensity of $10^{-8}cm^{-1}$ can be observed without much difficulty. It is proposed to study some asymmetric molecules, like CH_2Br_2.

535.84

442.170 Dwivedi, Chandra Prakash Dhar. Vibrational and electronic spectra of some mono- & di-substituted benzenes. Gorakhpur, Physics, 1961-66. Sharma, D., Professor and Head of the Department.

Infrared absorption spectra of N-ethylaniline, o-ethylaniline, o-, m- and p-anisaldehyde molecules in liquid state have been recorded and analysed. The near ultraviolet absorption spectra of the above molecules and that of N-methylaniline have been investigated in detail in the vapour phase.

(1) IJPAP. 2 ; 1964 : p. 105 ; (2) ibid. 3 ; 1965 : p. 452 ; and (3) ibid. 1 ; 1963 : p. 192.

535.84

443.171 Ganapathi, Puthenillam Madhathil. Spectroscopy. I. I. S., Bangalore, Physics, 1966-69. Narayanan, P. S., Asstt. Professor.

It is proposed to make a detailed study of infrared spectra of crystals which are ferroelectric. Hydrogen bond and low temperature studies will also be made. Polarized infrared radiation will be used to identify absorption frequencies. Raman spectra will be taken wherever necessary. The infrared spectra of sodium ammonium sulphate dihydrate has already been studied.

535.84

444.172 Gorbal, Mahantgouda Rayanagouda. Molecular spectra. Karnatak, Physics, 1963-68. Tawde, N. R., Vice-Chancellor, Marathwada University, Aurangabad.

Mercury radiations are used for exciting the fluorescence of dyestuffs in solution. Intensity and polarization measurements are in progress. Quenching measurements will be made to study the life time of the excited molecule by introducing inert gases.

535.84

445.173 Govindarajan, Jayaramachandran. Raman effect. I. I. S., Bangalore, Physics, 1965-68. Krishnan, R. S., Professor.

The research is mainly concerned with the vibrational spectra, Raman and infrared, of crystals with special reference to the study of hydrogen bonded crystals. In addition to the use of conventional Raman sources, lasers will also be used in the investigation.

535.84

446.174 Gupta, Surendra Narayan. Study of L-emission and absorption spectra of heavy elements. Vikram, Physics, 1965-69. Srivastava, K. S., Lecturer.

535.84

447.175 Haridasan, Thalakoti Madhathil. Raman effect and lattice dynamics. I.I.S., Bangalore, Physics, 1964-68. Krishnan, R. S., Professor.

The aim of the research is to interpret the vibration spectra of substitutional impurities in cubic crystals. Theoretical lattice dynamical models have been worked out to explain the infrared spectra of U-centres in alkali halides and substitutional defects in III-V semiconductors. The work is being extended to Raman spectra of defect lattices.

535.84

448.176 Joseph, Kuzhikkattukunnel Babu. Molecular physics. Kerala, Physics, 1964-67. Venkateswarlu, K., Professor and Head of the Department.

The work is being done on some aspects of molecular spectroscopy. This includes the investigation of force fields, mean amplitudes of vibration, shrinkage of bond lengths and vibration-rotation interaction.

535.84

449.177 Kameswara Rao, Peri. Studies in molecular spectra. Venkateswara, Physics, 1963-67. Rama Murty, K. S., Reader.

The study of emission spectra of certain organic molecules and molecular constants pertaining to vibrations and vibration-rotation interactions is in progress.

535.84

450.178 Karjuna Rao, K. Malli. Studies in molecular and solid state spectroscopy. I.I.T., Madras, Physics, 1964-67. Narayanaswamy, C. K., Lecturer.

Studies on intensities of vibrational bands in the ultraviolet region have been done. Studies on single crystals in the infrared region are underway. Studies on the corresponding single crystals using the Raman spectral technique will be taken up after the infrared work is over.

535.84

451.179 Katiyar, Ram Sharan. Raman effect in crystals. I.I.S., Bangalore, Physics, 1964-67. Krishnan, R. S., Professor.

Raman and infrared spectra of sulphamic acid and its salts have been studied using resonance radiation of mercury λ 2537 A.U. as the exciter. Wilson's F-G matrix calculations using Urey-Bradley potential functions have been made for sulphamic acid and sulphamate ion. Raman spectrum of magnesium fluoride has been recorded for the first time. The lattice dynamics of MgF_2, rutile and $KNiF_3$ have been studied along the Born's model.

(1) Proc. IAS. 1965 ; and (2) ibid. 1966.

535.84

452.180 Mariam, Seeni Sultan Moideen. Vibrations of polyatomic molecules. *D.Sc.* Kerala, Physics, 1963-66. Venkateswarlu, K., Professor and Head of the Department.

Theoretical study of the vibrations of polyatomic molecules is being made. The molecular constants, such as, potential constants, thermodynamic properties, mean amplitudes of vibration, shrinkage effect and the rotation-vibration interaction matrices have been obtained from spectroscopic data for different types of molecules.

(1) Molecular force fields : Bent XYZ type of molecules. IJPAP. 3; 1965 : p. 117; (2) Mean amplitudes of vibration : Bent XYZ type of molecules. Proc. IAS. 61 ; 1965 : p. 260 ; (3) Molecular constants and thermodynamic properties : C_2H_4O, C_2D_4O and C_2H_4S. ibid. 62; 1965: p.159; and (4) Mean amplitudes of vibration, shrinkage effect and thermodynamic properties : Linear XYZ molecules and ions. Proc. RAS, Belgium. 51 ; 1965 : p. 359.

535.84

453.181 Mathew, Mariamma Parakkadavil. Molecular vibrations. Kerala, Physics, 1964-67. Venkateswarlu, K., Professor and Head of the Department.

The molecular constants viz., potential energy constants, generalized mean amplitudes of vibration, shrinkage and coriolis coupling constants have been evaluated in the case of ethylene oxide, ethyl oxide-d_4, ethylene sulphide, methyl acetylenes, fluoroacetylenes and some bent triatomic systems.

Molecular constants and thermodynamic properties of ethylene oxide, ethyl oxide-d_4 and ethylene sulphide. Proc. IAS. 62 ; 1965 : p. 159.

535.84

454.182 Mehrotra, Vinod Kumar. Spectroscopic and dielectric studies of few aromatic compounds. Gorakhpur, Physics, 1964-67. Suresh Chandra, Reader.

The effect of different atoms or group of atoms at various positions of benzene ring on its vibrational modes is being studied by observing infrared and ultraviolet absorption spectra of different substituted benzenes. Substitution also changes the electric bond moments resulting in different values of dipole moment. To study this, the dipole moment of different substituted benzenes is also being measured.

535.84

455.183 Naik, Ramakrishna Chickayya. Investigations on the absorption and fluorescence spectra of rare earth ions. Karnatak, Atomic Energy Establishment, Trombay, 1964-66. Narasimham, N. A., Head of the Spectroscopy Division, Atomic Energy Establishment, Trombay.

Absorption and fluorescence spectra of Pr^{3+} in $Pr\,Cl_3$, KCl, KBr, NaCl have been investigated and their energy levels located. Lattice vibrations of $LaCl_3$ and $LaBr_3$ are being investigated by Pr^{3+} impurity fluorescence. A fluorescing level of Tb^{3+} in $LaCl_3$ has been located in ultraviolet by exciting its fluorescence by tesla coil energy.

(1) Lattice vibrations of (Pr, La) Cl_3 and (Pr La) Br_3 crystals. Proceedings of the C. S. I. R. symposium on spectroscopy and allied problems held at Banaras Hindu University, 1963. p. 48-56 ; (2) Curr. Sci. 34 (19) ; 1965 : p. 550-552.

535.844

456.184 Pandey, Bansh Raj. Spectra of some substituted benzenes. Gorakhpur, Physics, 1959-66. Sharma, D., Professor and Head of the Department.

Ultraviolet and infrared absorption spectra of p-fluoro, p-chloro, p-bromobenzonitriles and 2 & 3 chloropyridines have been studied.

535.84

457.185 Pandey, Rama Kant. Spectroscopy. Banaras, Spectroscopy, 1965-67. Upadhyaya, K. N., Lecturer.

The α and β systems of SnCl have been excited in presence of argon and photographed in the third and second orders respectively of the 35 feet concave grating spectrograph. The rotational analysis is in progress.

535.84

458.186 Pandey, S. M. Spectra of polyatomic molecules. Gorakhpur, Physics, 1961-66. Sharma, D., Professor and Head of the Department.

Fundamental vibrational frequencies of polyatomic molecules have been ascertained from the various spectra associated with them. Their modes have also been assigned in terms of normal modes as known in case of benzene.

535.84

459.187 Patan Deen Singh. Spectroscopic studies of diatomic and polyatomic molecules. Gorakhpur, Physics, 1963-67. Sharma, D., Professor and Head of the Department.

The spectra of following molecules have been studied in the ultraviolet and infrared, viz., p-fluorophenetole, m-fluoroanisole, o-, m-fluorobenzonitrile, o-, m-, p-chlorobenzo-trifluorides, p-phenetidine and m-difluorobenzene. The Franck-Condon factors and r-centroids of the following diatomic molecules have also been studied : C^1H^{12} (C→X) and (A→X) ; ZrO (A→X) and (C→X) $C^{12}P^{31}$ (B→A) band systems.

Proc. Phys. Soc. 87(4) ; April '66 : p. 1008-1009.

535.84

460.188 Pathak, Achyuta Nand. Spectroscopic studies of simple molecules. Gorakhpur, Physics, 1964-66. Sharma, D., Professor and Head of the Department.

The electronic and vibration spectra of the following polyatomic molecules have been studied : (a) o-difluoro benzene ; (b) m-difluoro benzene ; (c) m-chloro benzonitrile ; (d) m-chloro anisole ; and (e) p-methoxy phenol. F. C. F. and r-centroids of the following diatomic molecules have also been evaluated : (a) $C^{12}H^1$ molecule (C→X) and (A→X) band system ; and (b) ZrO molecules (A→X) band system.

F. C. F. and r-centroids of CaH molecule. Proc. Phys. Soc. 87 ; 1966 : p. 1008-1009.

535.84

461.189 Sar Nath Singh. Spectroscopy. Banaras, Spectroscopy, 1965-67. R. S. Singh, Reader.

The sensitized emission spectra of 1, 4 naphthoquinone, 2-methyl, 1, 4-naphth., anthraquinone, 1-chloro, 1, 5-dichloro, 1-methyl anthraquinone have been excited through transformer discharge in presence of flowing vapour of benzene. The visible emission spectra of all the molecules are found to involve one (S-S) and one (T-S) transitions. The various ground and excited state frequencies involved have been interpreted and correlated with Raman and infrared frequencies.

535.84

462.190 Shashidhar, M. A. Near ultraviolet absorption spectra of some organic molecules. Karnatak, Physics, 1962-66, Suryanarayana Rao, K., Reader.

The near ultraviolet absorption spectra of some organic molecules have been photographed in the vapour phase and then analysed. Infrared spectra have also been recorded and analysed where no infrared data are available. The molecules studied in these investigations are : (1) Ortho-, meta- and para-fluoroanilines (ultraviolet and infrared) ; (2) 2-, 4-, 6- and 7-methyl quinolines (ultraviolet absorption) ; (3) Ortho- and para-ethyl phenol (ultraviolet and infrared) ; and (4) 2-chloro-p-xylene (ultraviolet and infrared).

(1) Curr. Sci. 34 ; 1965 : p. 479 ; (2) ibid. 35 ; 1966 : p. 62 ; (3) ibid. 35 ; 1966 : p. 330 ; (4) Ind. Jour. Phys. 40 ; 1966 : p. 53 ; and (5) IJPAP. 4 ; 1966 : p. 170.

535.84

463.191 Srinivasan, G. J. Studies in molecular vibrations. Madras, Presidency College, 1964-67. Thirugnanasambandam, P., Chief Professor of Physics, Presidency College, Madras.

Raman and infrared spectra of polyatomic molecules have given rise to problems relating to the potential constants in molecules. Different attempts have been made to evaluate them in many cases with varying results. A fresh attempt is being made to solve the problem in a fundamental way.

535.84

464.192 Sriramachandra Rao, Chilukuri Venkata. Vibrational spectra and normal co-ordinate analysis of benzenes. Bombay, Atomic Energy Establishment, Trombay, 1964-67. Narasimham, N. A., Head of the Spectroscopy Division, Atomic Energy Establishment, Trombay.

Normal co-ordinate analysis of two sets of molecules, p,m,o,-fluoro-chloro and fluoro-bromo benzenes has been made using a modified method of least squares. The potential function used in the circulation is of the modified Urey-Bradley type. The calculations have shown that several of the assignments made earlier on the basis of experimental data are to be revised. A new assignment of the fundamentals is, therefore, proposed.

535.84

465.193 Srivastava, Kailash Chandra. Investigations of the spectra of some di-substituted benzenes. Gorakhpur, Physics, 1960-66. Sharma, D., Professor and Head of the Department.

Infrared and near ultraviolet spectra of a few di-substituted benzenes has been recorded and their vibrational analysis proposed.

535.84

466.194 Srivastava, Suraj Lal. Spectroscopic studies of some di- and tri-substituted benzenes. Gorakhpur, Physics, 1963-67. Sharma, D., Professor and Head of the Department.

The infrared and the ultraviolet absorption spectra of the following di-and tri-substituted benzenes have been studied : (1) o-fluoro aniline ; (2) m-fluoro aniline ; (3) p-fluoro aniline ; (4) 2,3 dichloro phenol ; (5) 2,4 dichloro phenol ; (6) 2,5 dichloro phenol ; (7) 2,4 dichloro aniline ; and (8) 2,5 dichloro aniline.

535.84

467.195 Thakur, Gulab. Spectroscopic studies of some inorganic molecules. Banaras, Spectroscopy, 1966-67. Nand Lal Singh, Professor and Head of the Department.

PbBr and NiCl have been excited by transformer discharge and recorded on fuess and large quartz spectrograph. These will be photographed in 35 ft. concave grating spectrograph.

535.84

468.196 Tripathi, Gorakh Nath Ram. Electronic and Raman spectra of simple molecules. Gorakhpur, Physics, 1962-66. Sharma, D., Professor and Head of the Department.

Infrared and near ultraviolet absorption spectra of some di-derivatives of benzene have been studied and interpretation of the electronic and vibrational transitions has been proposed.

535.84

469.197 Tripathi, Laxmi Narain. Absorption spectra of some di-substituted benzene derivatives. Gorakhpur, Physics, 1961-66. Sharma, D., Professor and Head of the Department.

The infrared and electronic absorption spectra of o-fluoroanisole, o-hydroxyanisole, p-fluorophenol and p-bromoaniline have been investigated. The assignments of observed bands have been proposed in terms of fundamental vibrations in the ground and excited states. Modes of vibrations have also been discussed.

(1) Near ultraviolet absorption spectrum of p-fluorophenol. IJPAP. 1 ; 1963 : p.229-230 ; (2) ibid. 2 ; 1964 : p.105 ; and (3) ibid. 3 ; 1964 : p.204.

535.84

470.198 Tulasigeri, Vasant Giridhar. Spectroscopy. Karnatak, Physics, 1963-67. Tawde, N.R., Vice-Chancellor, Marathwada University, Aurangabad.

The ultraviolet band system $B^2\pi - X^2\Sigma$ of A10 molecule has been excited in D.C. arc under *low pressure using specially designed vacuum chamber. Many of the* known vibrational bands have been measured and identified. The intensity aspect of these bands is being studied at present. It is also intended to study the theoretical aspect of the intensities, namely, transition probabilities.

535.84

471.199 Upendra Kumar. Electronic and vibrational spectra of some substituted anilines. Gorakhpur, Physics, 1963-67. Sharma, D., Professor and Head of the Department.

The infrared and ultraviolet absorption spectra of the following substituted anilines have been studied: (i) o-chloro aniline; (ii) m-chloro aniline; (iii) p-chloro aniline; (iv) p-fluoro N-methylaniline; (v) m-fluoro N-methylaniline; and (vi) o-fluoro N-methylaniline.

535.84

472.200 Usha Bai, Pyati. Normal vibrations of molecules and hydrogen bonding. Osmania, Physics, 1965-68. Puranik, P. G., Reader and Principal, Nizam College, Hyderabad.

The research is concerned with normal vibrations of molecules containing nitrogen and sulphur atoms. These molecules have a low symmetry and hence the numerical computations for solving secular equations involve the use of computer. The aim of the project is to assign the fundamental frequencies of polyatomic molecules on a quantitative basis.

535.84

473.201 Venkata Chalapathi, Vankamamidi. Spectroscopic studies of heavy molecules. Osmania, Physics, 1962-66. Venkata Ramiah, Kailasa, Reader.

The integrated absorption intensities of some of the bands arising out of the vibrations of the functional groups in amides have been completed and the effect of substitution and solvent on the integral intensities has been investigated. The normal vibrations of several molecules have been studied by the normal coordinate treatment. The purpose of this investigation is to study the coupling in the various modes of vibrations of polyatomic molecules and to correlate these results with the intensity variations.

(1) Proc. IAS. 58; 1963: p.233; (2) ibid. 60; 1964: p.242; (3) Curr. Sci. 34; 1965: p.12: (4) ibid. 34; 1965: p.687; (5) ibid. 35; 1966: p.3011; and (6) Jour. Mol. Spec. 12; 1964: p.301.

535.84

474.202 Zaidi, Zahid Husain. Spectroscopic study of molecules. Aligarh, Physics, 1966-69. Khanna, B. N.

535.84

See Also

CHEMISTRY, THEORETICAL CHEMISTRY, MOLECULAR STRUCTURE ;
PHYSICS, NUCLEAR PHYSICS, MOLECULAR STRUCTURE.

For Physical Properties of Crystals.

See

CHEMISTRY, CRYSTALLOGRAPHY.

Heat

Heat Transfer

475.203 Agarwal, Radhey Shyam. Some problems of heat transfer in fluids. Roorkee. Mathematics, 1964-66. Sharma, S. K., Reader.

It is proposed to cover an analysis of heat transfer in the flow of viscous and second order fluids. The effects of magnetic interaction are also being studied in some cases.

(1) Heat transfer from an enclosed rotating disc. ASR. 16(3); and (2) Hydro-magnetic free convection in a channel with porous walls. Roorkee Uni. Res. Jour. June '66.

536.25

476.204 Goel, Tara Chand. Thermal conductivity of metals at high temperatures. I. I. T., Delhi, Physics, 1966-68. Jain, S. C., Professor and Head of the Department.

The equipment for the investigation of thermal and electrical conductivities of metals and alloys at high temperatures has been fabricated. Preliminary results of the investigation of the conductivity of nickel have been obtained.

536.23

477.205 Gupta, Chaman Lal. Some heat transfer problems in buildings. Roorkee, Mathematics, 1964-67. Chandrika Prasad, Professor and Head of the Department.

Matrix method for computing thermal response of enclosures has been extended to include indoor convective radiative exchange network. Theoretical solutions have been derived for the following four cases of temperature distribution: In a hale space due to differential heating over an infinite strip and a rectangle respectively, and for an infinitely long and for a finite homogeneous prism subjected to boundary conditions of second and third kinds.

Jour. Inst. Heat. & Vent. Engs. 32(8) : p. 159-164.

536.23

478.206 Hira Nand. Heat and mass transfer in capillary porous bodies. Delhi, Mathematics, 1964-67. Thiruvenkatchar, V. R., D. C. S. O., Research and Development Organization, Ministry of Defence, Delhi and Indrajit Kumar, Senior Scientific Officer (I), Research and Development Organization, Ministry of Defence, Delhi.

The problems of heat and mass transfer in porous medium with additional field of molar motion of the moisture in the capillaries of body have been studied with different boundary conditions. Some problems in moist porous medium in contact with moving fluids have been completed. Integral method has been extended to the case of coupled phenomena of heat and mass transfer in porous medium.

536.2014

479.207 Janardhanan Achari, P. Boundary value problems in heat transfer. Kerala, Applied Mathematics, 1967-68. Indrajit Kumar, Senior Scientific Officer (I), Research and Development Organization, Ministry of Defence, Delhi.

Theoretical analysis of the following problems has been undertaken : (i) Transient state problems in complex regions by using Schwaise alternating process; (ii) Transient state problems of solids in contact with well stirred fluid using integral transform method ; and (iii) Nonlinear problems by using nonlinear integral equation.

536.2

480.208 Ravindra Kumar. Heat transfer in Bingham material. I. I. T., Delhi, Mathematics, 1964-67. Jain, M. K., Professor and Head of the Department.

Heat transfer phenomenon has been investigated in plane and rotatory couette flow of Bingham material. It has been shown that the dissipation, magnetic field and increasing values of Bingham number enhance the temperature proifile. A critical value of the Brinkman number is also computed in each case.

536.25

481.209 Tyagi, Ved Prakash. A theoretical study of viscous dissipation effects on general non-circular duct convective heat transfer. I. I. T., Kanpur, Mathematics, 1963-67. Kapur, Jagat Narain, Professor and Head of the Department,

536.25

482.210 Vijaya Narayan. Thermal conductivity at high temperatures. I. I. T., Delhi, Physics, 1966-68. Jain, S. C., Professor and Head of the Department.

High vacuum unit for the measurement of thermal conductivity and other physical properties of metals, alloys and semiconductors at high temperatures has been set up. Thermal conductivity and properties of sandwiches of metal-semiconductor-metal are being studied.

536.23

Effects of Heat on Matter

483.211 Dharm Vir Singh. Dynamical problems in thermo-elasticity. I. I. T., Kharagpur, Mathematics, 1965-67. Sinha, S. B., Lecturer.

The transient thermal stresses in semi-infinite media and an infinite thick plate with a cylindrical hole are being investigated.

536.41

484.212 Ghosh, Saral Kumar. Liquid formation. Calcutta, Physics, 1964-67. Ray, N. N.

536.414

485.213 Ramamurthy, L. Thermo-elastic behaviour of metals and crystals at low temperatures. Venkateswara, Physics, 1962-66. Bhimasenachar, J., Professor and Head of the Department.

The elastic behaviour of metals and crystals is being studied from room temperature to the boiling point of liquid air(—183°C) using the composite oscillator method.

536.414

Temperature

486.214 Nagi Reddy, B.P. Studies in low temperature physics. Venkateswara, Physics, 1964-67. Bhimasenachar, J., Professor and Head of the Department.

Thermo-elastic behaviour and the thermal expansions of some ferrites are being studied in the low temperature region. It is also proposed to study the ΔE-effect.

536.56

Calorimetry

487.215 Gambhir, Raghavendra Dheerendra. Phenomena near phase transition. I. I. S., Bangalore, Physics, 1965-68. Raja Gopal, E. S., Asstt. Professor.

Thermodynamic quantities near phase transitions are of fundamental importance. It is proposed to measure specific heat of liquid-liquid systems within a millidegree of their critical points. A adiabatic calorimeter suitable for the purpose is nearing completion.

536.63

Electricity & Electronics

Electromagnetic Fields & Waves

488.216 Arora, Arunesh Kumar. Interaction of electromagnetic waves with plasmas. I. I. T., Delhi, Physics, 1966-69. Sodha, M. S., Professor.

The linear and nonlinear demodulation of amplitude modulated electromagnetic wave in a dispersive medium has been investigated along with some other nonlinear phenomena.

537.12

489.217 Goswami, Satyendranath. Investigations on electrode discharges in the presence of a steady transverse magnetic field. Calcutta, Physics, 1964-67. Deb. S.

537.12

490.218 John, P. I. Nonlinear effects on the propagation of electromagnetic waves through a time varying, isotropic and homogeneous plasma. Aligarh, Physics, 1964-67. Sarkar, D. C., Reader.

A plasma generated by amplitude modulated radio frequency waves will have periodical variation of its electron density and collision frequency. A microwave beam passing through such a plasma will suffer periodically varying attenuation and phase, resulting in amplitude and phase modulation of the beam. The transferred modulation will be studied in terms of the various parameters of the plasma. The study is expected to throw more light on the ionospheric process known as the Wave Interaction or the Luxembourg Effect, which results due to the nonlinear interaction between two electromagnetic waves traversing the same region of the ionosphere.

The propagation of electromagnetic waves in a periodically varying medium. (with D. C. Sarkar). Jour. Inst. Telecom. Engs. 11(12) ; 1965.

537.123

491.219 Khare, Murarilal. Studies in magneto-electrects with reference to vix parspect etc. Vikram, Maulana Azad College of Technology, Bhopal. 1966-70. Bhatnagar, C. S., Professor, Maulana Azad College of Technology, Bhopal.

537.12

492.220 Paithankar, Ashok Shrikrishna. Measurement of Tounsend's coefficient in strong magnetic field. Indore, Physics, 1964-67. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G. S. T. Institute, Indore.

Measurements of first Tounsend coefficient for air with and without transverse magnetic field have been undertaken using a large cylindrical geometry by measuring the special growth of ionisation current for various values of E/p and H/p. These measurements are very useful in understanding the electrical breakdown mechanism in EXH fields.

Brit. JAP. Feb.'67.

537.12

493.221 Ram Pal Singh. Natural generation of electromagnetic waves and their propagation through earth's atmosphere. Banaras, Physics, 1966-68. R. N. Singh, Reader.

Natural processes of electromagnetic wave generation, such as, gyroradiation, synchrotron radiation, Cerenkov radiation and Bremasstrahlung radiation are under study to pin down the entire spectrum experimentally obtained in whistler, cosmic radio noise and radio astronomy. The propagation of electromagnetic wave spectrum and other related problems, such as, electromagnetic wave guidance, plasma heating etc., will also be studied.

537.12

494.222 Sant Ram. Interaction of electromagnetic waves with plasmas. I. I T., Delhi, Physics, 1966-69. Sodha, M. S., Professor.

The linear and nonlinear demodulation of amplitude modulated electromagnetic wave in a dispersive plasma as well as magnetoplasma has been investigated.

537.12

495.223 Sawhney, Birendra Kumar. Propagation of electromagnetic waves through ionized gases. I. I. T., Delhi, Physics, 1964-68. Sodha, M. S., Professor.

The effect of induced time dependence of the electron density on the propagation of modulated and unmodulated electromagnetic waves in a plasma has been analytically investigated.

537.12

Plasma & Plasma Dynamics

496.224 Basu, Dipak Kumar. Studies on plasma ion sources. Calcutta, Physics, 1962-67. Nagchaudhuri, B. D.

537.16

497.225 Dhir, Gurindar Singh. Plasma oscillations. I. I. T., Bombay, Electrical Engineering, 1965-68. Bhagavat, Gopal Krishnamurti, Professor.

Experiments have been conducted to study high frequency longitudinal oscillations of plasma electrons in hot cathode low pressure D. C. discharges. The variation in the frequency of oscillations has been studied with various parameters of the discharge. Frequency pulling effects have also been observed by the probe and by anode itself, probably due to some type of feedback mechanism. Experiments are being conducted to stabilise the oscillations under longitudinal magnetic fields.

537.16

498.226 Ghosal, Anil Kumar. Microwave studies on plasma. Calcutta, Radio Physics & Electronics, 1962-67. Sen, S. K., Reader.

537.16

499.227 Ghosh, Prashanta Kumar. Electromagnetic wave propagation in ionized media. Allahabad, Applied Physics & Technology, 1964-67. Ghosh, Satyendra Nath, Professor and Head of the Department.

Interactions of electromagnetic waves with thin plasmas are being studied in the presence of electro-acoustic fields.

537.16

500.228 Gupta, Kuldip Chand. Coupling of electromagnetic power to and from the beam-plasma systems. B. I. T. S., Pilani, Electronics, 1965-68. Chaudhuri, M., Professor and A. Singh, Director, Central Electronics Engineering Research Institute, Pilani.

The object of the study is to investigate coupling of power to and from beam-plasma system using the concept of launching surface waves on plasma enclosed in glass tubes.

537.16

501.229 Joshi, Narahari Vishnu. Evidence for plasma frequency in metals and its role in nucleation, Poona, Physics, 1964-67. Mande, C., Reader.

Plasma frequencies in a few transition metals have been recalculated theoretically taking into account the distribution of d and s electrons. Experimental evidence for these frequencies in metals has been proved in the extended fine structure of K absorption edge of these metals. These ideas will explain the reduction of grain size by the passage of electric current during solidification of metals.

Def. Sci. Jour. July, 1966.

537.16

502.230 Joshi, Sudhakar Bhaskar. Dynamic behaviour of gas discharge plasma under perturbation. Bombay, Institute of Science, 1963-67. Chiplonkar, V. T., Professor.

The radial distribution profile of particle density and energy in a diffusion controlled cylindrical plasma is being studied by the double probe method, with and without a perturbing R. F. signal.

537.16

503.231 Shah, Rajanikant Gordhandas. Dynamic response of gas discharge plasma. Bombay, Institute of Science, 1965-67. Chiplonkar, V. T., Professor.

It is proposed to study the R. F. conductivity of a cylindrical plasma as also to determine the electron density and collision frequency.

537.16

Electrostatics

504.232 Ayachit, V. G. Study of breakdown potential and current wave form of an A. C. discharge. Nagpur, Physics, 1963-67. Kher, V. G., Professor and Head of the Department of Physics, Vidarbha Mahavidyalaya, Amrawati.

In the study of a low pressure A. C. discharge in air, it has been observed that with an increase of frequency there is a large increase in the breakdown potential. A satisfactory explanation of this new phenomenon has been developed with the help of the statistical time lag. It has also been observed that the difference between the starting and the quenching voltage is large.

Physica. 30; 1964 : p. 702-712.

537.21

505.233 Mohammad Zahid. Non-local potentials. Aligarh, Physics, 1965-68. Naqvi, Jawad Husain, Lecturer.

An attempt is being made to obtain p-p scattering parameters using a separable non-local two-nucleon potential. Expressions for the scattering parameters have been obtained with the help of nuclear and coulomb forces. Investigation of the effect of nucleon magnetic moments on the parameters is in progress.

537.21

506.234 Narasimham, V. L. Nuclear many-body problems with non-local potentials. Aligarh, Physics, 1964-67. Khan, Zillur Rahman, Reader.

A separable non-local two-nucleon potential in $T=1$ state has been obtained using low energy two-nucleon data. The potential so obtained has been further used to study the properties of nuclear matter, the energy levels and spin-orbit level splitting in certain nuclei.

537.21

Dielectrics

507.235 Bhate, Madhukar Shridhar. Dielectric behaviour of liquids at microwave frequency region. Poona, Physics, 1966-69. Prem Swarup, Asstt. Professor, Institute of Armament Technology, Ministry of Defence, Poona.

The dielectric behaviour of fatty acids in the microwave region is being studied to determine the structure and chemical bonding of these molecules.

537.24

508.236 Bhattacharjee, Biswanath. Study of dielectric breakdown phenomenon of gases. North Bengal, Physics, 1964-66. Sen, S. N., Professor and Head of the Department.

The object of the research is to study (a) Dielectric breakdown of gases by external electric field of wide frequency range; (b) Susceptibility of breakdown mechanism to external electric and magnetic field; (c) External field effect on surface emitted secondary electron resonance breakdown mechanism; (d) Ring discharge; and (e) High frequency ionisation current.

537.24

509.237 Deshpande, Dhruvaraj Krishnarao. Studies in dielectric absorption of some organic molecules at microwave frequencies. Karnatak, Physics, 1963-67. Suryanarayana Rao, K., Reader.

Dielectric measurements in dilute solutions have been carried out on several organic molecules at both microwave and radio frequencies. The molecules belong to the groups of aldehydes, ketones and anilines. The dipole moments and relaxation times of all these molecules from microwave measurements and static measurements are being evaluated.

Curr. Sci. 35; 1966: p. 360.

537.243

510.238 Hegde, Madhav Subray. Some studies on ferroelectricity. Bombay, Institute of Science, 1964-67. Bhide, V. G., Professor and Head of the Department of Physics.

Ferroelectric properties of $PbTiO_3$ have been investigated. A new method of growing single crystals of $PbTiO_3$ has been developed. Complete phase diagram of Pb_3O_4 and TiO_3 with UF has been studied along with DTA and thermogravimetric analysis. Dielectric properties of $PbTiO_3$ at various frequencies ranging from audio to 100 Mc/Sec. have been investigated. Domain structure in $PbTiO_3$ has also been photographed.

537.24

511.239 Mohanty, Bidhan Krushna. Single and multiple photon processes in two energy level systems. I. I. T., Kharagpur, Physics & Meteorology, 1964-67. Venkatesh, H. G., Research Professor of Physics, Birla Institute of Technology, Mesra, Ranchi.

The expectation value of the dipole moment has been derived with the help of a geometrical model of the Schrödinger equation. The stimulated Raman type processes are being analysed with this model. The absorption or emission of power in the harmonics of the applied field frequency is also being studied.

537.243

512.240 Mukherji, Ram Narayan. Study of the dielectric behaviour of some aliphatic and aromatic molecules Patna, Physics, 1964-66. B. N. Singh, Vice-Chancellor, Bhagalpur University.

537.243

513.241 Patil, Ranganagouda Laxamanagouda. Dielectric behaviour of some organic molecules in the centimeter region. Karnatak, Physics, 1965-67. Suryanarayana Rao, K., Reader.

Studies in dielectric absorption at 3 cm. have been carried out on a number of aliphatic esters in dilute solutions. The dipole moments and relaxation times of all these molecules have been evaluated using single frequency method. The dipole moments of all these molecules have also been computed from the static measurements at a frequency of 1 Mc/sec. Similar studies of this group of molecules in the pure liquid state are in progress.

537.243

514.242 Rajput, B. S. Perturbed angular correlation. Kurukshetra, Physics, 1965-68. Hans, H. S., Professor and Head of the Department.

The object of the research is to study the perturbed γ-γ angular correlation by using external and internal magnetic field. With the help of this technique, it is proposed to measure the magnetic dipole moments of some excited states, assuming that the magnetic field is known.

537.243

515.243 Srivastava, Shyam Chandra. Dielectric relaxation in polar liquids and solids. Gorakhpur, Physics, 1965-68. Suresh Chandra, Reader.

Two benches for the measurement of the dielectric constants, loss factor and dipole moment of the substances have been set up, one for the radio frequency range and the other for microwave range. The dipole moment determination of substances is in progress.

537.243

516.244 Vikram Singh. Perturbed angular correlation. Kurukshetra, Physics, 1965-68. Hans, H. S., Professor and Head of the Department.

The object of the research is to study the perturbed angular correlation by using external and internal magnetic field. With the help of this technique, it is proposed to measure the magnetic dipole moment of some excited states, assuming that the magnetic field is known or vice-versa.

537.243

517.245 Vij, Jagdish Kumar. Dielectric properties of the molecules. Panjab, Physics, 1965-68. Srivastava, K. K., Reader.

Different structures for a few derivatives of amines, ethers and iodides have been proposed from time to time by several investigators. It is expected that the study of dielectric properties of molecules, like dipole moment, relaxation time etc., in various solvents and at various frequencies would lead to some definite conclusions regarding their structure. The data of relaxation time vs. viscosity would give some definite idea about the exact nature of solute and solvent interactions.

537.243

Electronics

518.246 Kamra, Adarsh Kumar. Long and short time variations in atmospheric potential gradients and point discharge currents. Roorkee, Physics, 1963-67. Varshneya, N. C., Reader.

Three parameters in atmospheric electricity, namely, potential gradients, point-discharge currents and wind velocity have been recorded continuously on three different pen-recorders. The long and short time variations in potential gradients will be studied in both fair and disturbed weather. The correlations of the above three parameters will also be studied.

537.52

519.247 Khenwar, Gajendra Singh. Studies on the frequency and energy of gas discharge excited by steady and alternating potentials and the various aspects of the influence of external irradiation. Vikram, Holkar Science College, Indore, 1964-68. Joshi, D. D., Asstt. Professor, Holkar Science College, Indore.

537.53

520.248 Kukshiwala, N. M. A. Mechanism of glow discharge. Bombay, Institute of Science, 1963-67. Chiplonkar, V. T., Professor.

The radial distribution of electron current density is being studied on the anode surface of diffusion-controlled cylindrical discharge plasma as a function of the discharge parameters.

537.52

Ionisation of Gases

521.249 Gupta, Rabindranath. Study of electrical and kinetic properties of ionised gases. North Bengal, Physics, 1963-67. Sen, S.N., Professer and Head of the Department.

The electron temperature, electron density and other allied properties can be deduced from a study of electrical conductivity of ionised gases. Their variation with temperature, pressure, discharge current, magnetic and electric field will give information regarding the interaction of electric field with plasma. The determination of electron mobility and diffusion will help understanding the breakdown properties of gases. The mean free path viscosity and thermal conductivity of ionised gases will also be determined.

537.532

522.250 Kaulgud, Shyamkant Ramchandra. Studies in gaseous electronics. Bombay, Institute of Science, 1965-68. Chiplonkar, V. T., Professor.

The study of electron density, collision frequency and diffusion length of cylindrical diffusion-controlled plasma has been undertaken.

537.532

523.251 Shamim Ahmad. Impact ionization and related problems in breakdown of silicon P-N Junction. B. I. T. S., Pilani, Physics, 1966-68. Khokle, W. S.

It is useful to study the mechanism of impact ionization leading to avalanche multiplication in semi-conductors in detail because of increasing applications of avalanche diode in producing high frequencies. This will help in predicting important physical properties, such as, operating point, gain available etc., for designing the above devices.

537.532

Radio - & Microwaves

524.252 Anjaneya Sastry, Bachimanchi. Microwaves paramagnetic resonance. I. I. T., Madras, Physics, 1965-68. Rama Sastry, C., Asstt. Professor.

The electron paramagnetic resonance studies will be carried out with a simple E.P.R. spectrometer. Work is in progress in regard to the construction of a simple E. P. R. spectrometer.

537.5344

525.253 Sinha, Bharati. Investigation on the absorption of extremely high frequency microwaves. Calcutta, Physics, 1963-67. Kastha, G. S., Professor, Optics, Indian Association for Cultivation of Science, Calcutta.

537. 5344

526.254 Wadehra, Narottam Singh. Electrostatic and radiation characteristics of radio atmospherics. Banaras, Physics, 1965-66. Tantry, B. A. P., Reader.

Audio frequency spectrum of atmospherics at large distances has been studied both theoretically and experimentally. The observed shift in peak frequency with propagation distance has been found to be in agreement with theoretical curves. Phase spectra of distant atmospherics has also been studied. The attenuation characteristics of smooth type and reflection type atmospherics are being derived experimentally.

537.534

X- and Gamma Rays

527.255 Chivate, Pushpa Raghunath. X-ray spectroscopy. Poona, Physics, 1965-68. Mande, C., Reader.

The construction of a double crystal X-ray spectrometer has been undertaken. It is proposed to study the fine structure of X-ray absorption edges of solids with the help of this instrument.

537.5352

528.256 Dixit, Manohar Narayan Rao. Study of the electronic spectra of P_2, PO and PD^+ molecules. Karnatak, Atomic Energy Establishment, Trombay, 1963-66. Narasimham, N. A., Head of the Spectroscopy Division, Atomic Energy Establishment, Trombay.

High resolution studies have been made of the electronic spectra of new molecules like PD^+, a new system of PO, and that of some bands of a known system of P_2. Isotope shifts in the electronic spectra of PO and PD^+ molecules are being studied.

Proc. IAS. 62 : p. 314.

537.5352

529.257 Kanitkar, Pundlik Laxman. Some studies in Joshi effect under visible radiations, X-rays and γ-rays. Poona, Physics, 1963-66. Mande, C., Reader.

The mechanism of D. C. discharge in externally excited systems and the influence of external radiations thereon has been studied. The measurement of charge transferred in such discharge processes has been done in dark and under irradiation.

537.535

530.258 Lal, Krishan Murari. Investigation of electronic spectra of the hydrides of the III Group of the Periodic Table in the vacuum ultraviolet region. Aligarh, Physics. 1965-68. Khanna, B. N., Reader.

The visible band system of lead bromide has been recorded in the second order of 21ft. grating spectrograph and the rotational analysis is in progress. The C–X system of indium chloride at 2700A° has been recorded for the first time in emission along with the A–X and B–X systems. It is proposed to make fine structure studies of bismuth bromide and indium chloride molecules.

537.5352

531.259 Lingam, Kollipare Veereswari. Studies in electron spin resonance. Bombay, Atomic Energy Establishment, Trombay, 1961-67. Narasimham, N. A., Head of the Spectroscopy Division, Atomic Energy Establishment, Trombay.

Electron paramagnetic resonance of the systems cs(Uo$_2$) (No$_3$), CdF$_2$.Eu$_2$$^+$ and CaWo$_4$Cr has been studied. Irradiated cs(Uo$_2$) (No$_3$)$_3$ has revealed the existence of (No$_3$) radicals trapped in this crystal. CdF$_2$.Eu^{2+} showed that Eu^2 substitutes Cd. The crystal field parameters and their signs have been determined. The anisotropy and hyperfine structure of the spectrum from CaWo$_4$ Cr has shown that Cr is pentavalent.

537.5352

532.260 Menon, Koravangant Govindankutty. X-ray diffraction studies in fibres. Kerala, Physics, 1964-67. Venkateswarlu, K., Professor and Head of the Department.

Coir and other local fibres are under investigation. Effect on the structure and properties of these fibres due to chemical treatments is being studied.

537.535

533.261 Misra, Ram Kishore. Study of spectra in the vacuum ultraviolet region of the halides of the III Group of the Periodic Table. Aligarh, Physics, 1965-68. Khanna, B. N., Reader.

A vacuum arc has been designed and fabricated for the study of hydrides. The spectrum of cadmium hydride molecule has been recorded at 4900A°, 4500A° and 3200A° with the help of this arc. Few bands of thallium hydride have also been recorded in the region 3600-3700A° and the analysis is in progress.

537.5352

534.262 Nagavekar, Arun Shankarrao. X-ray spectroscopic study of chemical bonding in some transition metal selenides. Poona, Physics, 1963-67. Mande, C., Reader.

X-ray spectroscopic and magnetic studies have been carried out to study some intermetallic compounds of transition metals, which have assumed great importance due to their semiconducting properties. The empty orbitals in solids have been studied by X-ray absorption spectroscopy. Magnetic study provides information regarding d electrons distribution. Thus, evidence for chemical bonding has been obtained by combining these two methods.

IJPAP. 3 ; 1965 : p. 483.

537.5352

535.263 Rama Krishna Rao, Tummala Venkata. Electronic spectra of diatomic molecules. Venkateswara, Physics, 1963-68. Lakshman, S. V. J., Lecturer.

Studies of different electronic states of the fifth group elements have been undertaken with particular emphasis on molecular orbital theory.

537.5352

536.264 Yogendra Kumar. Study of the electronic spectra of the halides of III (B) Group elements of the Periodic Table. Aligarh, Physics, 1964-67. Khanna, B. N., Reader.

The spectrum of aluminium chloride has been photographed on a lower dispersion spectrograph. Few bands have been recorded in the region 2100A° and the work of photographing it on 3 meter vacuum grating spectrograph is in progress. A vacuum system has also been designed to make a xenon continuum source for absorption studies of third group halides in the vacuum ultraviolet region. The construction of xenon source is in progress.

537.5352

Photoelectric Effects

537.265 Acharya, Haranarayan. Studies in preparation and properties of thin photoconducting films. I. I. T., Kharagpur, Physics & Meteorology, 1965-68. Bose, H. N., Professor and Head of the Department.

The mechanism of photoconduction in lead sulphide has been investigated with reference to preparation parameters. An attempt is being made to resolve its electrical structure and recombination mechanism.

537.54

538.266 Guha, Samiran. Some investigations in the physics of magnetohydrodynamic power generation. I. I. T., Delhi, Physics, 1966-69. Sodha, M. S., Professor.

Work has been done on photoconductivity of dust-laden gas and electron density in interplanetary space. It is proposed to investigate the use of neutron and electron irradiation to increase the conductivity of the working fluid of the MHD generator, and then to use such a system for closed-cycle MHD power generator.

537.54

539.267 Mishra, Salig Ram. Study of positive and negative Joshi effect in a photo cell. Vikram, Holkar Science College, Indore, 1964-68. Joshi, D. S., Asstt. Professor, Holkar Science College, Indore.

537.54

Electron & Ion Optics

540.268 Prabhawalkar, Prabhakar Damodar. Solid state physics: Field ion microscopy. Indore, Physics, 1964-67. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G. S. T. Institute, Indore.

Field ion microscopy has assumed importance for the study of solid state physics. Two types of field ion microscopes have been constructed, one with static vacuum and the other with a dynamic vacuum system. In the latter, it is expected to obtain higher intensities on the screen. Tungsten lips of 1000 A.V. with two types of high voltage power supplies have been made. The microscopes are being tested with the help of tungsten and will be used later for other metals and alloys.

537.56

Electric Currents

Semiconductors

541.269 Ashok Kumar. Solid state electronics. Allahabad, Applied Physics, 1965-68. Ghosh, Satyendra Nath, Professor and Head of the Department.

It is proposed to study the internal structures of metals and semiconductors in the form of thin films by Hall effect and nuclear magnetic resonance experiments to understand the basic physics involved in various solid state devices.

537.622

542.270 Ganesan, Susila. Semiconductors. I. I. S., Bangalore, Physics, 1960-67. Suryanarayanan, G., Asstt. Professor.

The research deals with the study of recombination and trapping of current carriers at cobalt and tellurium atoms in germanium. The required doped crystals have been grown and their lifetime as a function of temperature measured by three methods. From these studies, the capture cross sections of carriers by the differently charged centers and their temperature dependence have been estimated.

537.622

543.271 Gupta, Subhendu. Hot carriers transport in semiconductors. Calcutta, Radio Physics & Electronics, 1964-67. Nag, B. R., Reader.

537.622

544.272 Mahadevan, Sudha. Semiconductors. I. I. S., Bangalore, Physics, 1961-67. Suryanarayanan, G., Asstt. Professor.

The work is concerned with the avalanche breakdown studies in semiconductor diodes. Germanium and silicon diodes have been prepared by the diffusion technique and the junction capacitance near the breakdown region has been measured. An increase of capacitance at the breakdown region has also been observed. Theoretical explanations for these have been attempted. It is also proposed to carry out these measurements at various low temperatures.

537.622

545.273 Mathur, R. S. Development of semiconductors. I. I. T., Delhi, Physics, 1966-68. Jain, S. C., Professor and Head of the Department.

Solar cells have been fabricated by diffusion of phosphorus and boron into p- and n-type silicon material. Open circuit voltage, under direct sunlight, has been found to be about 0.4 volt, whereas short circuit current is about 300 microamps.

537.622

546.274 Shaha, Anil Bahadarmal. Electrical properties of some semiconductors. Indore, Applied Physics, 1963-69. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G. S. T. Institute, Indore.

It is proposed to study the electrical properties of some semiconductors at low temperature and find the anomalies with those at room temperature. It is also proposed to measure electron mobility, electron concentration, resistivity and temperature dependence of 'Hall coefficient' for germanium, silicon, Indian arsenide etc.

537.622

547.275 Sreenath, Rudrapatna Narayanaswamy. Solid state physics and transistor physics. I. I. T., Madras, Physics, 1965-68. Ramasastry, C., Asstt. Professor.

It is proposed to develop a 'direct torque method' for the determination of the dielectric constant of solids which, in turn, accounts for the defects in solids.

537.622

548.276 Subrahmanya Murty, Vinjanampaty. Solid state and transistor physics. I.I.T., Madras, Physics, 1965-68. Ramasastry, C., Asstt. Professor.

The work has been undertaken to construct a simple electron spin resonance spectrometer. Initial studies on phase sensitive detectors have been completed and automatic frequency control of klystron has been achieved. Work on the construction of the remaining parts of electron spin resonance spectrometer is in progress.

537.622

549.277 Tripathi, K. Galvanomagnetic and thermoelectric studies on doped semiconducting alloys. Gorakhpur, Physics, 1960-66. Srivastava, G. P., Reader.

The alloys of Bi_2, Te_{3-y} Se_y doped with controlled amounts of Cu, CuBr, and $Bi\text{-}I_3$ have been prepared. Thermoelectric and galvanomagnetic studies have been made and the results discussed in terms of the chemical bonding in bismuth-telluride.

537.622

550.278 Venkateswara Rao, Mikkilineni. Semiconductors. I. I. S., Bangalore, Physics, 1965-69. Suryanarayanan, G., Asstt. Professor.

It is proposed to study the recombination of electrons and holes in semiconductors particularly germanium and silicon doped with different elements to understand the capture cross sections and the role of foreign atoms in recombination. The studies are being carried out by means of recombination noise, transient photoconductivity etc., at low temperatures. Lifetime has been measured in cobalt and tellurium doped germanium using transient decay to evaluate few capture cross sections.

537.622

Alternating Current & Circuitry

551.279 Anikhindi, Ramesh Ganesh. The analysis and interpretation of current pulses in alternating current discharges. Indore, Physics, 1961-66. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G. S. T. Institute, Indore.

It has been observed that very sharp pulses occur randomly when a gas is excited between non-conducting electrodes by alternating voltage. These pulses have been analysed electronically and interpreted as due to the surface charges deposited on the walls. Irradiation of the electrodes with light reduces the surafce charges as also the pulse height.

537.63

552.280 Chaudhuri, Jyotsnakumar. Alternating current magnetic measurements. Calcutta, Applied Physics, 1965-67. Sengupta, A. K., Professor.

537.63

553.281 Mohammad Fahim. Study of the electrical activity of sensory organs. Aligarh, Physics, 1964-67. Syed Fazal Mohammad, Reader.

The following electronic circuits required for stimulating the nerve fiber and recording the electrical response have been assembled and tested : (1) Schmidt trigger delay and pulse generators ; (2) Sweep generator; (3) D. C. amplifier ; (4) Time-mark generator ; (5) Cathode follower; and (6) Four power supplies.

537.63

554.282 Phadke, Kamlakar Waman. Study of A. C. discharges by Langmuir probe method. Indore, Physics, 1964-68. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G. S. T. Institute, Indore.

It is proposed to measure the ion temperature and electron energy distribution in A. C. discharges of audio and radio frequencies using the conventional Langmuir probe method. The knowledge of such data will be useful in understanding the mechanism of A. C. discharges, which have not yet been fully explained. The special feature of this probe technique is that it allows the scanning of the whole discharge region by varying the position of the probe.

537.63

Magnetism

Magnetic Induction

555.283 Sangisapu, Narasimha Murthy. A study on the effects of an externally applied magnetic field on the thermoelastic deformation of a solid body. Indore, Mathematics, 1965-68. Paria, Gunadhar, Professor and Head of the Department of Mathematics, G.S.T. Institute, Indore.

Jour. Sci. Engg. Res. 10(1); 1966.

538.23

Magnetic Materials & Permeability

556.284 Banerjee, Shyamal Kumar. The effect of magnetic dilution on the paramagnetic behaviour of iron group ions in crystals. Burdwan, Physics, 1964-68. Mookherji, A., Dean, Faculty of Science.

The effect of replacing progressively the paramagnetic ions in the tutton salt cyrstals of the type MSO_4, R_2SO_4, $6H_2O$, where M=Cu, Ni, Fe, Co etc., and R=K, NH_4, Rb etc., by diamagnetic ions like Fu++ and Mu++, on the magnetic anisotropy and susceptibility will be studied. The observed changes will be explained in the light of ligand field theory.

Crystal field theory of Cu^{++} ion in the magnetically diluted crystal of $2K_2(Fu,Cu)(SO_4)_2$, $6H_2O$. Ind. Jour. Phys. 39 ; 1965 : p.530.

538.43

557.285 Chachra, Satya Pal. The principal magnetic susceptiblities of rare earth ions in crystals at low temperature. Burdwan, Physics, 1963-67. Mookherji, A., Dean, Faculty of Science.

The magnetic properties of paramagnetic ions of rare earth in sulphate and ethyl sulphate lattices will be studied from room temperature to liquid oxygen temperature. The results so obtained will be discussed in the light of crystalline electric field theory having tetragonal and hexagonal symmetries.

(1) IJPAP. 3 ; 1965 : p.191; (2) ibid. 3 ; 1965 : p. 459 ; and (3) ibid. 4 ; 1966 : p.45.

538.43

558.286 Satya Murthy, N.S. Neutron diffraction studies of magnetic materials. Bombay, Atomic Energy Establishment, Trombay, 1962-66. Ramanna, R., Head of the Physics Division, Atomic Energy Establishment, Trombay.

Neutron diffraction determinations of antiferromagnetic and ferrimagnetic structures of a number of binary alloys, such as, $FeGe_2$, $Fe_{1\cdot67}$ Ge, $Mn_{1\cdot74}$ Sn have been made. The magnetic moments as well as transition temperatures have been determined. A polarised neutron diffraction study of manganese cobalt carbide has been carried out to determine its magnetic structure, removing an ambiguity which results from the use of unpolarised neutrons. The exchange integrals operating in the paramagnetic state of MnO have been evaluated using long wavelength (4Å) neutrons on a rotating crystal neutron spectrometer.

538.4

559.287 Shanmugasundaram, V. Magnetism. Annamalai, Physics, 1961-66. Sriraman, S., Professor and Head of the Department.

An attempt has been made to correlate the exaltation of the magnetic susceptibilities with infrared frequency shifts as well as intensity variations arising due to molecular interactions. The temperature variations of the susceptibilities of the alkali metals and their amalgams have also been studied.

(1) Thermo-magnetic study of mercury and dilute amalgams of sodium and potassium. Bull. Chem. Soc. Japan. 34;1961 : p. 1288-1291; (2) The diamagnetic study of the nature of association in acetic acid. ibid. 37;1964 : p. 395-398; (3) The diamagnetic study of the nature of the association of acetic acid and the binary systems of acetic acid with triethylamine, pyridine and anline. ibid. 38;1965 : p.1391-1393; and (4) The formation constants of 1:1 and 1:2 complexes of ethyl acetate and phenyl acetate with phenol. ibid. 39;1966 : p. 1070-1071.

538.4

Magnetohydrodynamics

560.288 Agrawal, Suresh Chandra. Stability of superposed fluids. I.I.T., Kanpur, Mathematics, 1965-68. Rathy, Rajendra Kumar, Assoc. Lecturer.

The stability of superposed fluids and parallel flows in hydromagnetic fluids with Hall effect is being studied.

538.6

561.289 Banerjee, Mihir Baran. Stability of superposed fluids. I. I. T., Kanpur, Mathematics, 1965-68. Jain, Rajendra Kumar, Lecturer.

The stability of rotational couette flow and the stability of superposed fluids is being studied.

538.6

562.290 Bani Singh. Some problems in magnetohydrodynamics and allied topics. Roorkee, Mathematics, 1965-67. Gupta, Subhash Chandra, Reader.

It is proposed to study the following problems : (i) Steady magnetohydrodynamic flow between two coaxial cylinders under radial magnetic field, with suction and injection ; (ii) Heat transfer by laminar flow between coaxial cylinders under action of radial magnetic field ; and (iii) Non stationary flow of a conducting fluid between coaxial cylinders in presence of a radial magnetic field.

538.6

563.291 Bhat, Pradman Krishen. Some magnetohydrodynamics stability problems. I. I. S., Bangalore, Applied Mathematics, 1965-68. Bhatnagar, P. L., Professor.

It is proposed to study the stability of conducting cylindrical shells of finite thickness in the presence of various types of magnetic fields. The magnetohydrodynamics of flow in wavy cylindrical annulus will also be investigated.

538.6

564.292 Isaac, R. Jayakaran. Stability problems in magnetohydrodynamics. I. I. S., Bangalore, Applied Mathematics, 1965-68. Bhatnagar, P. L., Professor and Oberoi, C., Lecturer.

It is proposed to study the stability of conducting fluids of astrophysical interest with special reference to self-gravitating mediums. The effects of plane stratification, magnetic fields and rotation on the medium will be investigated and the stability of the interface between conducting and non-conducting fluids will also be examined.

538.6

565.293 Jagdish Prakash. A theoretical study of magnetohydrodynamic and hybrid bearing. I. I. T., Kanpur, Mathematics, 1963-67. Kapur, Jagat Narain, Professor and Head of the Department.

Magnetohydrodynamic lubrication is being studied.

538.6

566.294 Mandal, K. K. Some flow problems in magnetohydrodynamics with and without heat transfer. I. I. T., Kharagpur, Mathematics, 1966-68. Rao, U. S., Lecturer.

It is proposed to study some hydromagnetic flows through duct, and a problem on hydromagnetic free convective heat transfer.

538.6

567.295 Radhakrishna, C. V. Flow and heat transfer problems in magneto-fluid dynamics. I. I. T., Delhi, Mathematics, 1965-67. Mehta, K. N., Lecturer.

The following flow and heat transfer problems have been investigated : (1) Unsteady flow of conducting fluids in channels of various geometries ; (2) Flow development in the entrance region of channels ; and (3) Oscillatory flow over an infinite flat plate with time dependent suction.

538.6

568.296 Raghavachar, M. R. Problems in magnetohydrodynamics. I. I. S., Bangalore, Applied Mathematics, 1964-67. Bhatnagar, P. L., Professor.

The gravitational instability in the presence of Hall current and transport properties in a multicomponent assembly on the basis of generalised B-G-K model and fokker-planck formalism are being studied.

(1) Jour. I I S. 46(3) ; 1964 : p. 91 ; and (2) ibid. 48(2 & 3) ; 1966 : p. 81.

538.6

569.297 R. P. Singh. Some problems in magneto-fluid dynamics. I. I. T., Delhi, Mathematics, 1965-67. Mehta, K. N., Lecturer.

The work is being carried out on two problems : One, concerning a two-layer fluid system ; and the other, some unsteady motions of cylinders.

538.6

570.298 Sachdeva, B. K. Plasma oscillations and hydromagnetics. Delhi, Mathematics, 1965-68. n. g.

538.6

571.299 Sathi, H.L. A study of some magnetohydrodynamics problems. I. I. T., Delhi, Mathematics, 1964-68. M. P. Singh, Asstt. Professor.

The effect of rotation, suction etc., in hydromagnetics is being investigated.

538.6

572.300 Sud, V. K. Some problems in hydromagnetics. I. I. T., Delhi, Mathematics, 1964-68. M. P. Singh, Asstt. Professor.

The problems regarding flow past a wavy wall are being studied.

538.6

573.301 Vijai Kumar. Some problems on hydromagnetic and plasma flow. Roorkee, Mathematics, 1965-68. Chandrika Prasad, Professor and Head of the Department and Gupta, S. C., Lecturer.

It is proposed to investigate problems on hydromagnetic flow, ordinary hydrodynamic flow and the flow of ionised gases. The study may also include steady and unsteady flows, and problems on stability of flows and heat transfer.

538.6

Geomagnetism

574.302 Mahaseth, Ram Narayan. Study of magnetic properties of certain Indian rocks. Patna, Physics, 1964-66. Dutt, Sudhir Kumar, Reader, Department of Physics, Science College, Patna.

Necessary apparatus has been set up for the measurement of natural remanant magnetism and magnetic susceptibility in a low field of Rajmahal trap rocks. Measurements are in progress. Various stability tests are being carried out. Experiments will also be done to separate the permanent magnetisation from the induced magnetisation.

538.72

575.303 Rakshit, Arun Kumar. Magnetisation and demagnetisation of certain Indian rocks. Patna, Physics, 1964-68. Dutt, Sudhir Kumar, Reader, Department of Physics, Science College, Patna.

Rock samples of Rajmahal traps from different localities have been collected and cylindrical and disc specimens cut out of them. Apparatus has been constructed for the measurement of hysteresis and production of A. C. demagnetising field free from earth's field.

538.72

576.304 Rishi Narain Singh. Theoretical studies in geomagnetism. Banaras, Geophysics, 1965-67. Rathor, H. S., Head of the Department.

A detailed study is being made of the theory of magnetic field of the earth. Certain parameters have been devised for the study, and improvements made on certain basic ideas about the theory of internal and external causes of earth's magnetic field. Some fundamental suggestions about the causes of magnetic storms have also been advanced.

538.7

577.305 Sinha, Ajit Kumar, Electromagnetic wave propagation through anisotropic and in homogeneous earth. I. I. T., Kharagpur, Geology & Geophysics, 1964-67. Bhattacharya, P. K., Professor.

The electromagnetic wave propagation from a vertical magnetic dipole, buried inside a homogeneous earth, has been studied in detail. The influence of anisotropy and inhomogeneity of the earth on electromagnetic wave propagation from vertical and horizontal electric dipoles and magnetic dipoles have also been studied thoroughly. The reflection of plane e. m. waves - inclined - from an anisotropic earth is being studied.

538.748

578.306 Suryanarayana Murthy, Doodala. Studies of earth tides at Hyderabad. Osmania, Geology, 1966-68. Bhimasankaram, V. L. S., Reader.

The records of the variations of gravity field will be obtained for about one year and analysed for various components of the tidal gravity field. It is also proposed to study some of the properties of the crust, like residity etc.

538.748

Ionosphere

579.307 Agrawal, B. S. Absorption of short radio waves in ionosphere and irregularities of ionospheric layers. B.I.T.S., Pilani, Physics, 1965-70. Sharma, S.C., Asstt. Professor.

The diurnal and seasonal variations of the absorption of radio waves will be studied at vertical incidence with the help of a pulse transmitter, communication receiver and oscilloscope. The study of the field strength of down-coming radio waves from different radio stations will be made with the help of a pen recorder to estimate the fractional attenuation in different layers of ionosphere.

538.767

580.308 Basu, Sunanda. Some ionospheric studies by means of satellites. Calcutta, Physics, 1965-67. Chatterji, J. S., Professor, Telecommunication Engineering, Jadavpur University.

538.767

581.309 Jani, Kanti Lal. Studies on the ionosphere and radio propagation. Gujarat, Physics, 1966-68. Kotadia, Kantilal Motilal, Reader.

The recording of field strength of radio waves received from a distant transmitter on different frequencies and over different distances has been done. Fading rates and absorption of the signals, effects of magnetic storms in the F_2-layer of the ionosphere at different latitudes, and ionospheric structural variations following nuclear explosions are being studied.

Jour. Atmos. Terr. Phys. February, 1967.

538.767

582.310 Krishna Rao, Teegala Venkata. Studies in ionospherics. Venkateswara, Physics, 1964-68. Bhimasenachar, J., Professor.

Ionospheric absorption measurement has been done by cosmic radio noise method. The aerial system for the cosmic noise measurement consists of collinear half-wave dipoles backed by a corner reflector. The output from the aerial system has been fed to a standard communication receiver (Philips BX 925A/09) and the detected output of the receiver has been recorded after further amplification.

538.767

583.311 Misra, Krishna Dutt. Study of ionosphere irregularities. Banaras, Physics, 1965-67. R. N. Singh, Reader.

Ionospheric conductivity for the sunspot maximum and minimum has been computed and its usefulness in explaining the formation and the characteristics of electrojet layer studied. Role of electric field thus generated and horizontal and vertical drift velocities produced has been compared with the experimental data. World wide variation of these features is being studied. Growth and decay of ionospheric irregularities, the motion and deformation in shape will also be studied.

538.767

584.312 Patel, Bhikhalal Mohanlal. Studies on absorption of radio waves in the ionosphere at different frequencies. Gujarat, Physics, 1966-68. Kotadia, Kantilal Motilal, Reader.

The project includes the construction of a pulsed radio transmitter, receiver, display and recording devices and antenna systems for vertical radiation and reception. Measurements over a long period of absorption on four different fixed frequencies per hour are planned. The results so obtained at Ahmedabad will help establish solutions for some unsolved problems.

538.767

585.313 Ramakrishnan, Seshadrinatha Iyer. Studies of the ionosphere over low latitudes. Kerala, Physical Research Laboratory, Ahmedabad, 1962-67. Ramanathan, Kalpathi Ramakrishnan, Professor, Physical Research Laboratory, Ahmedabad.

Ionospheric investigations are being carried out using artificial satellites, launched by U.S.A. The propagation of radio waves between satellites and the earth has been utilised for studying some of the properties of the ionosphere. The daily and seasonal variations of the total electron content in the ionosphere and also irregular variations in space and time are under examination. These have been integrated with ionospheric data obtained simultaneously from ground based ionosonde measurements.

538.767

586.314 Sant Prakash. Study of the ionospheric electron content using radio signals from artificial earth satellites. Kurukshetra, Physics, 1966-69. Lal, J. B., Lecturer.

It is proposed to undertake the study of diurnal, seasonal and solar activity variations in the total ionospheric electron content in the Indian subcontinent. Such study has now become possible with the launching of the specially equipped artificial earth satellites.

538.767

587.315 Srivastava, Suresh Kumar. Absorption and drifts in ionosphere. Banaras, Physics, 1965-67. Tantry, B. A. P., Reader.

Measurement of ionospheric absorption has been carried out using cosmic radio noise technique since November, 1964. From the experimental sidereal time curve, the total attenuation, D & F layer attenuations throughout the period under investigation have been computed and the diurnal and seasonal variations of the same studied. The simultaneous measurement of ionospheric absorption from pulse technique as well as cosmic radio noise technique are in progress. Drift measurements will also be carried out along with absorption measurements.

538.767

Modern Physics

Molecular Structure

588.316 Apparao, Kollepara Venkata Satyarama. High resolution studies of diatomic molecules. Bombay, Atomic Energy Establishment, Trombay, 1965-67. Narasimham, N. A., Head of the Spectroscopy Division, Atomic Energy Establishment, Trombay.

A new band system of Cu Br molecule has been obtained and the vibrational analysis carried out. Rotational analysis of C, D and E systems of Cu I molecule has been done and that of Cu Br molecule and near infrared bands of S_2 molecule is in progress.

539.12

589.317 Darji, Arvindbhai Becharbhai. Investigations on the spectra of some diatomic molecules. Baroda, Physics 1965-67. Patel, M. M., Reader.

The study of band spectra of the halides of mercury has been undertaken. Band systems in the ultraviolet region have been photographed for these molecules. The analysis of the bands is in progress. With new results, it will be possible to correlate data already obtained in the laboratory for the halides of zinc and cadmium.

539.12

590.318 Dasgupta, Nandakisor. Theoretical studies in electronic structure of molecules. Calcutta, Physics, 1963-68. Some, S. C., Professor, Presidency College, Calcutta.

539.12

591.319 Dhumwad, Ramachandra Krishnaji. Band Spectra of diatomic molecules. Bombay, Atomic Energy Establishment, Trombay, 1661-67. Narasimham, N. A., Head of the Spectroscopy Division, Atomic Energy Establishment, Trombay.

Rotational analysis of some of the bands of the orange system of FeO has been carried out. A $^1\Sigma$-$^1\Sigma$

transition is attributed for this system. The low pressure are used for excitation is found to reduce the intensity of highly excited atomic lines of iron. Work on the rotational analysis of the so called high pressure carbon bands is in progress. Perturbations of a number of rotational levels are being studied.

539.12

592.320 Dixit, Ramachandra Mahipat. Spectroscopic studies of some uranyl compounds. Karnatak, Atomic Energy Establishment, Trombay, 1963-66. Narasimham, N. A., Head of the Spectroscopy Division, Atomic Energy Establishment, Trombay.

An investigation of fluorescence and infrared absorption spectra of alkali uranyl nitrate compounds has been carried out. The effect of reactor radiations on the fluorescence spectra of $CsUO_2(NO_3)_3$ and $Rb\ UO_2\ (NO_3)_3$ is being studied.

Proc. IAS. 60 ; 1964 : p. 90.

539.12

593.321 Girijavallabhan, Chakkalakkal Pavothil. Molecular spectroscopy and molecular vibrations. Kerala, Physics, 1965-68. Venkateswarlu, K., Professor and Head of the Department.

The generalised mean square amplitudes and coriolis coupling coefficients of six molecules and one ion belonging to the planar X_2Y_4 model have been evaluated. Normal coordinate analysis of non-planar X_2Y_4 molecules is in progress.

539.12

594.322 Gnanadesikan, S. G. Determination of molecular constants from spectroscopic data and infrared spectroscopic investigations of molecular interaction. Annamalai, Physics, 1963-66. Krishna Pillai, M. G., Reader and Ramaswamy, K., Reader.

On the theoretical side, attempts have been made to determine the potential energy constants, rotational distortion constants, mean amplitude of vibration and thermodynamic properties of some XY_2Z, XY_2ZW and XY_3ZWR molecules using available vibrational spectral data by the method of Wilson F-G matrix. On the experimental side, a systematic study has been made of the solvent effects on the carbonyl bands of proton acceptors in various mixtures of proton donors and CCl_4.

(1) Anharmonicity corrections and potential constants of difluoramine. Z. Phys. Chem. 228; 1965: p. 157; (2) Potential constants, rotational distortion constants and mean square amplitudes of vibration of NH_2CN

and ND_2CN molecules. IJPAP. 3 ; 1965 : p. 273 ; (3) Molecular constants of SIH_3C CH and SiD_3C CH. Chk. Jour. Phys. B16 ; 1966 ; (4) Influence of solvents on infrared frequencies: The complexing of phenyl acetate, methyl ethyl ketone and benzaldehyde with ortho cresol. Jour. Mol. Spec. 17; 1965 : p. 370; and (5) Influence of solvents on infrared frequencies : The carbonyl bands of phenyl acetate, methyl ethyl ketone and benzaldehyde. Aust. Jour. Chem. 19 ; 1966 : p. 1089.

539.12

595.323 Jacob, Rajan K. Study of the spectra of diatomic molecules. Baroda, Physics, 1964-66. Patel, M. M., Reader.

It is proposed to study the molecular spectra of zinc halides. A few band systems in the ultraviolet region have been reported by earlier workers. The spectra of these molecules are expected to have two systems each in the visible region. They have been photographed and are being analysed.

539.12

596.324 Malathy Devi, Venkatraman. Evaluation of molecular constants from spectroscopic data. Kerala, Physics, 1963-66. Venkateswarlu, K., Professor and Head of the Department.

It is proposed to determine the fundamental vibrational frequencies of some important molecules and use them to study their molecular constants. Molecular constants, such as, potential constants, mean square amplitudes of vibration, shrinkage constants and coriolis constants of rotation vibration interaction in some polyatomic molecules are being investigated.

(1) Mean amplitudes of vibration : Pyramidal XYZ_2 type molecules. Curr. Sci. 34(5); 1965; (2) Mean amplitudes of vibration : Some silicon compounds of the XY_3Z type. ibid. 34(12) ; 1965 : p. 373; (3) Molecular force fields : XYZ_2 type of molecules. IJPAP. 3(4) ; 1965 ; p. 120 ; (4) Mean amplitudes of vibration : XY_2Z_2 type molecules. ibid. 3(6) : 1965; p. 195; and (5) Mean amplitudes of vibration : Molecules of AXYZ type. Proc. IAS. 67 ; 1965 : p. 272.

539.12

597.325 Mohanty, Braja Sundar. Studies on the spectra of diatomic molecules. Banaras, spectroscopy, 1966-68. Nand Lal Singh, Professor and Head of the Department.

The rotational analysis of fifteen bands of the β-system of Po has been carried out. Three bands of the A-X and B-X system of CaF have been measured and analysed. Five bands of the B-X system of BiF have been photographed and their analysis is in progress. Franck condon factors and γ-centroids of the C'-X system of Po and B-X system of CaF have also been calculated.

539.12

598.326 Natarajan, Arthanari Pillai. Molecular spectroscopy and molecular vibrations. Kerala, Physics, 1965-68. Venkateswarlu, K., Professor and Head of the Department.

General valence force field, thermodynamic properties and generalized mean amplitudes of vibrations of X_2Y_6 type of molecules have been evaluated.

539.12

599.327 Patel, Suryakant Purshottamdas. Investigations on the spectra of diatomic molecules. Baroda, Physics, 1963-66. Patel, M. M., Reader.

The band spectra of halides of cadmium have been investigated. Some electronic states not known so far have been noticed.

539.12

600.328 Pichai, R. Studies in molecular force fields and infrared spectroscopic investigation of molecular interactions. Annamalai, Physics, 1964-66. Krishna Pillai, M. G., Reader and Ramaswamy, K., Reader.

On the theoretical side, an attempt has been made to modify the UBFF for molecules having the lone pair of electrons. This will help explain the structure of the inorganic molecules on the basis of electron repulsion theory. On the experimental side, a systematic study has been made of the solvent effects on the carbonyl bands of proton acceptors in various mixtures of proton donors and CCl_4.

(1) Molecular force field for chlorine trifluoride. Aust. Jour. Chem. 18 ; 1965 : p. 261 ; (2) Vibrational amplitudes of thionyl tetrafluoride and sulphur tetrafluoride. ibid. 18; 1965 : p. 1575; (3) Molecular force field for sulphur tetrafluoride. Can. Jour. Chem. 43 ; 1965 : p. 463 ; (4) Influence of solvents on infrared frequencies : The complexing of methyl ethyl ketone and acetophenone with p-cresol. ibid. 18 ; 1965 : p. 1681 ; (5) Influence of solvents on infrared frequencies : The complexing of methyl ethyl ketone and methyl benzoate with chloroform. Ind. Jour. Chem. 3(11) ; 1965: p. 510; and (6) Infrared studies of hydrogen bonding in mixtures of p-cresol with ketones. IJPAP. 41; 1966 : p. 210.

539.12

601.329 Rajalakshmi, Karimpanasseri Venkateswaran. Molecular vibrations and spectroscopic study of biophysical problems. *D.Sc.* Kerala, Physics, 1963-66. Venkateswarlu, K., Professor and Head of the Department.

Theoretical spectroscopic studies of some organic molecules of biological significance and certain other inorganic molecules have been carried out. The molecular constants, namely, the force constants, generalized mean square amplitudes of vibration, shrinkage of the bond lengths, coriolis coupling constants and thermodynamic properties have been evaluated from the vibrational frequencies. Some electron spin resonance studies in irradiated nucleic acids and nucleotides have also been made.

(1) Mean amplitudes of vibration : Bent symmetrical XY_2 molecules and groups. Proc. IAS. 60;1964: p. 51 ; (2) Mean amplitudes of vibration: Pyramidal XYZ_2 molecules. ibid. 61 ; 1965 : p.255; (3) Mean amplitudes of vibration, shrinkage effect and thermodynamic properties: Linear XY_2 molecules and ions. Bull. Roy. Acad. Belgium. 51 ; 1965: p. 359 ; and (4) Les liasons hydrogene et la radioresistance des polynucleotides en phase solide. C. R. Acad. Sci. 261 ; 1965 : p. 4879.

539.12

602.330 Rudrayya, Yadwad Malkajayya. The studies in the spectra of diatomic molecules. Karnatak, Physics, 1962-67. Tawde, N. R., Vice-Chancellor, Marathwada University.

HgH molecule has been excited in a condensed discharge. The external heating has produced pronounced effects on the spectrum of HgH molecule. It is intended to study the external heat effect on HgH molecule to understand its mechanism of formation.

539.12

603.331 Shankar, Mundaragi Basappa. Studies in molecular spectra. Karnatak, Physics, 1962-66. Tawde, N. R., Vice-Chancellor, Marathwada University.

The hydroxyl radical has been excited by passing high frequency electrodeless discharge through water vapour. The formation of OH molecule has been studied with parameters : (i) Voltage applied to the discharge ; (ii) Pressure of water vapour ; and (iii) The electrode distance. The role of helium on the formation of OH radical has also been studied. On the basis of the observations, the mechanism of formation of the OH $({}^2\Sigma^+ \rightarrow {}^2\pi_i)$ molecule is being critically examined.

539.12

604.332 Srivastava, Yogendra Prasad. Studies in molecular spectra and molecular structure. Gorakhpur, Physics, 1965-68. Sharma, D., Professor and Head of the Department.

The near ultraviolet spectra of the following molecules have been studied: (1) p-bromophenetole; (2) p-ethoxy phenol; (3) m-dibromobenzene; and (4) o-dibromobenzene. The F. C. factor and r-centroids of GeO & S_2 molecules have also been calculated.

539.12

605.333 Venkatesh, Gopadi Mahabala. Spectroscopic and optical studies on crystals. I. I. S., Bangalore, Physics, 1964-67. Narayanan, P. S., Asstt. Professor.

Some important 'soft' ferroelectric and related crystals, such as, glycine addition compounds are being investigated with the help of Raman and infrared spectroscopic methods. It will throw light on the hydrogen bonds in these crystals and provide a structure-spectra correlation. Detailed studies at different temperatures and with deuterated compounds are also being made to understand the ferroelectric transition.

Proc. IAS. 1966.

539.12

See Also

CHEMISTRY, THEORETICAL CHEMISTRY, MOLECULAR STRUCTURE;

PHYSICS, LIGHT, SPECTROSCOPY.

Nuclear Physics

606.334 Rajagopal, Shanta. Application of dispersion theoretic methods and nuclear physics. Calcutta, Physics, 1964-67. Pal, M. K., Professor, Saha Institute of Nuclear Physics, Calcutta.

539.7

Fundamental Radiations

607.335 Bandyopadhyay, Dalipkumar. Analysis of characteristics and bending energies of the nuclei. Calcutta, Pure Physics, 1963-67. Datta, A. K., Professor and Head of the Department (Retd.).

539.72

608.336 Cowsik, Ramanath. Particle production of high energies. Bombay, Tata Institute of Fundamental Research, Bombay, 1963-67. Yash Pal, Professor, Nuclear Emulsion Section, Tata Institute of Fundamental Research, Bombay.

Investigations are being carried out on the following topics: (1) Experimental study of pion production at high energies ; (2) Theoretical calculations of the development of 'extensive air-showers' ; (3) Propagation of cosmic ray nuclei in interstellar space and the effects of the same on their energy spectra and composition ; (4) Considerations regarding origin of electrons and positrons in primary cosmic rays ; and (5) Development of magnetic spectrometer to measure cosmic ray energy spectra.

539.72

609.337 Jagdish Bahadur. Application of radioactive techniques to civil engineering problems. Poona, Physics, 1964-66. Banerjee, Shanti Lal, Chief Research Officer.

The property of elastic scattering of gamma-rays and neutrons is employed for inplace soil density and moisture measurements. Variations due to factors e.g. thickness, diameter and material of tubes are being studied. These studies conducted in the laboratory will be employed in the interpretation of the field data for a few subsoil investigations.

Irrigation & Power. 23(1) ; 1966 : p. 75-79.

539.72

610.338 Neelakantan, K. A. Solar modulation of low energy galactic cosmic ray alpha particles and protons. Bombay, Tata Institute of Fundamental Research, Bombay, 1960-66. Daniel, R. R., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

The variations in the properties of the galactic cosmic ray protons and alpha particles at low energies due to the 11 year activity of the sun are being studied. This study is expected to throw light on the electromagnetic properties of the interplanetary medium and the nature of the mechanism that modulates the cosmic radiation.

539.72

611.339 Sastry, Subbanna Ch. Nuclear scattering. Calcutta, Physics, 1963-68. Mukherjee, Suprakash, Reader, Saha Institute of Nuclear Physics, Calcutta.

539.72

612.340 Sharma, Hari Chand. Some calculations on scattering cross section. Banaras, Physics, 1966-67. N. Nath, Reader.

539.72

613.341 Sundararajan, Ramamurthi. Neutron and γ-ray emission from the sun. Bombay, Tata Institute of Fundamental Research, Bombay, 1965-69. Gokhale, Gajanan Shridhar, Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

The experiments are being conducted to detect the emission of high energy neutrons from the sun. The stars produced in a caesium iodide crystal will be used for detection and the detector will be flown at high altitudes with the help of plastic balloons. A similar detector with Pb glass will be flown to detect γ-rays during flares. The theoretical aspects of the problem will also be investigated.

539.72

614.342 Venkatavaradan, Vanavasi Srinivasaiyengar. Implications of cosmogenic isotopic changes to geophysics and astrophysics. Bombay, Tata Institute of Fundamental Research, Bombay, 1964-68. Devendra Lal, Professor, Tata Institute of Fundamental Research, Bombay.

Several useful calculations and interpretations have been made pertaining to phenomena associated with the radiation from solar flares, cosmic rays and solar beams, and the resultant radioactive and stable products. The effect of atmosphere-ocean exchange on radiocarbon content of the atmosphere has also been investigated in detail. Some experiments concerning the evaluation of flux of cosmic matter on to the earth are underway.

539.72

Fundamental Particles

615.343 Ansari, Abdul Rasheed. Interaction of 25 GeV protons with emulsion nuclei. Aligarh, Physics, 1964-67. Mohammad Shafi, Reader.

The work is being done on the interaction of 25 GeV protons with the complex nuclei of emulsion. The aim of the experiment is to collect information on the energy spectra and angular distribution of protons, neutrons, photons and helium nuclei produced in the interaction.

539.721

616.344 Bandyopadhyay, Satyanarayan. Scattering of electrons by atoms. Calcutta, Physics, 1964-67. Basu, D., Reader, Indian Association for Cultivation of Science, Calcutta.

539.7211

617.345 Bansal, Narendra Kumar. Neutron thermalisation. I.I.T., Delhi, Physics, 1966-69. Ghatak, A. K., Asstt. Professor.

The solutions of the one velocity neutron transport equation are being extensively studied under various approximations. The solutions can be compared to the experimental decay of fast neutron bursts in non-moderating assemblies.

539.7213

618.346 Bhalla, K. B. Study of elementary particles using nuclear emulsions. I.I.T., Delhi, Physics, 1965-69. Lokanathan, S., Asstt. Professor.

The study of energy spectrum of neutral baryons from 27-GeV proton interactions in carbon has been completed. Hyperfragment studies using 1.5-and 3.5-GeV K^-stacks, obtained on loan from Oxford University, are in progress. These are expected to yield some useful results for the lifetime of light hyperfragments; range, mass spectrum and mesic decays of heavy hyperfragment; and, production frequency of hyperfragment from Σ^-capture stars.

539.721

619.347 Bhatnagar, Krishan Gopal. Design and construction of fast coincidence circuits for the accurate measurements of e-e scattering cross section. Jabalpur, Physics, 1963-66. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G.S.T. Institute, Indore.

The actual measurements of e-e scattering cross section are in progress. A transverse beta-ray spectrometer is being used to provide the desired magnetic field in the scattering chamber. For beam selection, a sector magnet, a velocity selector as also the power supplies have been designed and constructed in the laboratory. The work on design, construction and testing of the light collecting systems has also been carried out.

IJPAP. 3(12); 1965 : p.500-501.

539.7211

620.348 Bhattacharya, Pradeep Kumar. Design and construction of a 60° double focussing magnetic spectrometer and its use in a new method of energy measurement of beta-rays. Indore, Physics, 1964-67. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G.S.T. Institute, Indore.

A 60° prismatic spectrometer has been constructed and used for energy selection of beta-rays. By this method, the incident energy at the target and the absolute differential scattering cross section has been measured simultaneously during the scattering run. Energy of the beam at the target has also been calculated by determining the angle between the defining and conjugate counters and the coincidence counting rate in between them, when one of them is slowly rotated about the axis of the target by means of worm arrangement.

539.7211

621.349 Chattopadhyay, Gurudas. Scattering and capture of electron by atomic system. Calcutta, Physics, 1963-67. Basu, D., Reader, Indian Association for Cultivation of Science, Calcutta.

539.7211

622.350 De, Mihirlal. Quantitative electron microscopy and associated problems. Calcutta, Pure Physics, 1964-67. Dasgupta, N. N., Professor, Saha Institute of Nuclear Physics, Calcutta.

539.7211

623.351 Ghosh, Parthasarathy. Some topics in elementary particle physics. Calcutta, Physics, 1965-67. Bose, S. N., National Professor of Science.

539.721

624.352 Jha, S. K. Study of elementary particles using nuclear emulsions. I. I. T., Delhi, Physics, 1965-69. Aditya, P. K., Asstt. Professor.

The energy spectrum of neutral baryons from 27-GeV proton interactions in carbon has been studied. Work on hyperfragment studies using 1.5 and 3.5-GeV K^-stacks obtained on loan from Oxford University has recently been taken up. It is expected to yield some useful results for the lifetime of light hyperfragments ; range, mass spectrum and mesic decays of heavy hyperfragment as also for production frequency of hyperfragments from Σ^- capture stars.

539.721

625.363 Kelkar, Vasudeo Balkrishna. Some aspects of the theory of elementary particles. Bombay, Institute of Science, 1957-67. Bhide, V. G., Professor and Head of the Department of Physics.

Anomalous scattering of high energy μ mesons by nuclei has been investigated. Parameters of the complex refractive index have been determined and the mass of the exchange quantum between meson and nucleon has been computed. The nuclear scattering of high energy electrons by carbon and oxygen has been investigated to determine the proton density distribution. Spin structure of 180° block walls has been studied and the distortion by inhomogenous magnetic field is being investigated.

539.721

626.354 Lal, Kunj Behari. Interaction of 25 GeV protons with emulsion nuclei. Aligarh, Physics, 1965-68. Mohammad Shafi, Reader.

The work is being done on the interaction of 25 GeV protons with the complex nuclei of emulsion. The aim of the experiment is to collect information on the energy spectra and the angular distributions of protons, neutrons, photons and helium nuclei produced in the interactions.

539.721

627.355 Mukhopadhyay, Sailajananda. High energy electron scattering and related phenomena. Calcutta, Physics, 1963-67. Duttamazumdar, S., Professor, Department of Physics, I. I. T., Kharagpur.

An approximate method for calculating the scattering of high energy electrons from nuclei has been developed and used for determining the charge distribution in the nuclei. The method has also been successfully applied to the case of multiple scattering of electron in matter.

Elastic scattering of high energy electrons. Ann. Physik. 16 ; 1965 : p. 360.

539.7211

628.356 Naqvi, Alim Husain. Interaction of 25 GeV protons with emulsion nuclei. Aligarh, Physics, 1964-67. Mohammad Shafi, Reader.

The work is being done on the interaction of 25 GeV protons with the complex nuclei of emulsion. The aim of the experiment is to collect information on the energy spectra and the angular distribution of protons, deuterons, photons and helium nuclei produced in the interaction.

539.721

629.357 Pattanaik, Mamata. Investigation in quantum field theory of elementary particles. Calcutta, Physics, 1964-67. Pradhan, T., Professor, Indian Association for Cultivation of Science, Calcutta.

539.721

630.358 Ray, Salilranjan. Some topics in elementary particle interactions. Calcutta, Physics, 1962-67. Datta Ray, Binayak.

539.721

631.359 Sarkar, Nurul Haque. Electron scattering by carbon and mono thickness of carbonaceous matter in electron microscopy. Calcutta, Pure Physics, 1961-67. Dasgupta, N. N., Professor, Saha Institute of Nuclear Physics, Calcutta.

539.7211

632.360 Shastri, Arun Gopal. Measurements on the e-e scattering cross sections using a transverse β-ray spectrometer. Indore, Physics, 1965-68. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G.S.T. Institute, Indore.

Measurements on the e-e scattering cross section using a transverse β-ray spectrometer and a modification page type apparatus have been made. A study of the energy variation of this cross section has been carried out between energies 0.2 MeV to 1.0 MeV. A double focussing 60° sector magnet has been used for the proper selection of incident energy of electrons.

539.7211

633.361 Shukla, M. G. Measurements on p-e scattering cross sections using a transverse beta-ray spectrometer. Indore, Physics, 1966-70. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G. S. T. Institute, Indore.

It is of interest to measure the Bhabha exchange parameter involved in the scattering of positrons and electrons. A modified page type scattering chamber has been constructed for the same. The energy selection of incident positrons will be effected by a double focussing 60° sector magnet.

539.7211

634.362 Stephens, A. S. Study of meson production at cosmic ray energies. Bombay, Tata Institute of Fundamental Research, Bombay, 1964-67. Daniel, R. R., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

A study is being made of primary cosmic ray electrons of energies greater than 12 GeV and the related astrophysical quantities existing in the space, where they spend most of their life time. Their relationship with the primary nucleon component of the cosmic radiation and their possible existence in the galaxy will also be investigated.

539.7216

635.363 Trivedi, Upendra. Dispersion theoretic treatment of pocesses involving elementary particles. Bombay, Tata Institute of Fundamental Research, Bombay, 1963-67. Udgaonkar, B. M., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

An ansatz by Khuri representing the contribution of a Regge-trajectory has been modified to exhibit higher exchanges. It has been applied to π-N scattering assuming that nucleon and N* lie on Regge-trajectories. A dynamical calculation embodying the reciprocal bootstrap nature of nucleon and N* is being made.

539.721

636.364 Venkataraman, Ganesan. Slow neutron inelastic scattering from condensed state of matter. Bombay, Atomic Energy Establishment, Trombay, 1963-66. Ramanna, R., Head of the Physics Division, Bhabha Atomic Research Centre, Trombay.

Studies have been made of rotational motions of NH_4^+ ion in several salts, spin fluctuations in paramagnetic $KMnF_3$ and centre of mass motions in liquid CD_4 with the help of neutron spectrometers at the cirus reactor at Trombay.

539.7213

637.366 Yoginder Singh. Applications of dispersion relations to elementary particles processes. Bombay, Tata Institute of Fundamental Research, Bombay, 1963-68. Udgaonkar, B. M., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

A crossing matrix for SU(3) has been worked out and attempts are being made to apply current algebra techniques to weak decay processes.

539.721

Penetrating Radiations

638.366 Bhasin, Harikrishan Chananmal. Resonance absorption of X-rays. Bombay, Institute, of Science, 1964-67. Bhide, V. G., Professor and Head of the Department of Physics.

The mossbauer effect for Fe^{57} in $SrTiO_3$ is being investigated. $SrTiO_3$ has been used both as a source and an absorber. Using it as a source, it has been possible to detect a cubic-tetrahegonal phase transformation at 110°K. Fe^{57} mossbauer probe has invariably been associated with oxygen valency. In hydrogen fixed Fe doped $SrTiO_3$, pockets of ferrimagnetic iron clusters have been detected. These clusters disperse on heating in air.

539.7222

639.367 Bhat, Narendrakumar Vinayak. Study of X-ray absorption edge of yittrium in various compounds. Bombay, Institute of Science, 1964-67. Bhide, V. G., Professor and Head of the Department of Physics.

The K.X-ray absorption of edge of yittrium in various chemical compounds is being investigated using bent crystal X-ray spectrograph. It has been possible to determine the degree of covalency in a given compound from the shift of the absorption. The fine structure of absorption edge is also being studied.

539.7222

640.368 Chohan, Vijay Singh. Energy spectra of heavy nuclei ($Z \geqslant 10$) of primary cosmic rays near solar minimum. Panjab, Physics, 1964-67. Anand, Bal Mukand, Professor and Head of the Department.

The energy spectra of heavy nuclei ($Z \geqslant 10$) of primary cosmic rays near solar minimum have been studied with the help of emulsion stacks exposed over Fort Churchill in June 1963 and June 1964. The effects of solar modulation and ionisation losses that these nuclei undergo while traversing the interplanetary and interstellar spaces are under investigation.

Jour. Geophys. Res. 71(19); 1st Oct. '66 : p.4687-4691.

539.7223

641.369 Deo Raj. Hyperfine structure studies of some iron compounds by Mossbauer effect. Roorkee, Physics, 1964-68. Puri, Satya Pal, Reader.

Hyperfine structure studies mainly consist of measurements of isomeric shifts, quadrupole splitting and the effects of magnetic field acting on the Mossbauer nuclei. It has been planned to measure these in terms of ferricyanides of 3d-elements, Tulton salts and iron compounds of the type ICFeS2, replacing K by Na, Ag and Cu. These will help in further understanding the valence state, chemical bonding and crystal structure of these compounds.

539.7222

642.370 Gopala, Venkataraman. Neutron and high energy radiation dosimetry. Bombay, Atomic Energy Establishment, Trombay, 1963-68. Ganguly, A. K., Head, Health Physics Division, Atomic Energy Establishment, Trombay.

Theoretical neutron spectra of (αn) sources, like Ra. Be, Po. Be, Pu. Be and Am. Be have been studied. Spectrum of Am. Be source is being measured to see how far it tallies with theory.

539.7222

643.371 Kailash Chandra. The study of internal magnetic field of low excited nuclear levels by Mossbauer effect. Roorkee, Physics, 1963-68. Puri, Satya Pal, Reader.

Mossbauer effect provides a tool to measure the life time, chemical shifts and hyperfine fields of low excited nuclear levels. Fe-Sb intermetallic compounds and few ferrites of spinol structure have been chosen for investigating the effect of such environments and the bonding of Fe in such compounds.

539.7222

644.372 Kunte, Prabhakar Krishnaji. Study of primary cosmic radiation. Bombay, Tata Institute of Fundamental Research, Bombay, 1965-68. Gokhale, G. S., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

It is proposed to study the chemical composition of multiply charged particles of primary cosmic radiation near the geomagnetic equator. The detector system, consisting of two large area scintillators and a Cerenkov detector and the necessary electronic circuits, has been set up and is under test. The instrument would be flown to high altitudes using large balloon at Hyderabad.

539.7223

645.373 Mohinder Singh. Studies on the elastic scattering of gamma rays. Punjabi, Physics, 1961-66. Sood, B. S., Professor and Head of the Department.

The topic deals with the polarization and Z dependence studies of the elastic scattering of gamma rays. It has been found that the earlier polarization measurements are in error and the present measurements agree well with the exact calculations of Brown and Mayer. The Z dependence measurements show a continuous variation of Z dependence index with momentum transfer.

(1) Nucl. Phys. 62 ; 1965 : p.267-272 ; (2) ibid. 64 ; 1965 : p.502-512 ; (3) Curr. Sci. 32;1963 : p.401-402; (4) ibid. 33 ; 1964 : p.77-78 ; and (5) Nu. Cim. 35 ; 1965: p. 1047-1051.

539.7222

646.374 Mundra, Jayanti Prasad. Cosmic rays. Calcutta, Physics, 1960-67. Senchaudhuri, P. K., Lecturer, Presidency College, Calcutta.

539.7223

647.375 Nair, K. Narayanan. Time variation of cosmic rays. Kerala, Physical Research Laboratory, Ahmedabad, 1962-67. Sarabhai, Vikram A., Professor and Director of Cosmic Rays, Physical Research Laboratory, Ahmedabad.

Vertical narrow angle, cube and inclined telescopes of different geometries have been assembled for the continuous monitoring of the hard component of cosmic ray intensity in vertical, east, and west directions at the equatorial sea level station of Trivandrum. The necessary data has been collected and analysed.

539.7223

648.376 Pabbi, Shiv Datt. Charge spectra of heavy nuclei ($Z \geqslant 10$) of primary cosmic radiation near solar minimum. Panjab, Physics, 1964-68. Mittra, I. S., Reader.

The charge spectra of heavy nuclei ($Z \geqslant 10$) is under investigation. For this purpose, two stacks of nuclear emulsions have been exposed at Fort Churchill (Geomganetic latitude=73°N) at an average residual atmospheric height of 4 gm/cm^2. The charge spectra of the source will be obtained.

Jour. Geophys. Res. 71(19) ; 1st Oct. '66 : p. 4687-4691.

539.7223

649.377 Puri, R. K. Flux and energy spectrum of the component of primary cosmic radiation and electromagnetic phenomenon. I. I. T., Delhi, Physics, 1963-67. Aditya, P. K., Asstt. Professor.

The flux of helium component of primary cosmic radiation has been studied near geomagnetic latitude during different periods of IQSY and therefrom the energy spectrum has been estimated for alpha particles of energy $\leqslant$ 20 GeV. The electromagnetic phenomenon involving the radiation cross section of electrons of 800 MeV energy in nuclear emulsion has also been theoretically calculated and experimentally determined. The electromagnetic spectrum has been studied in plates exposed to 3 GeV electron accelerator.

539.7223

650.378 Ramadurai, Souriraja. Nature of the primary cosmic radiation. Bombay, Tata Institute of Fundamental Research, Bombay, 1965-68. Biswas, S., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

The composition, energy spectra and relative abundance of various types of nuclei have been studied with the help of a nuclei emulsion stack flown from Fort Churchill, Canada, in June 1963. Information regarding the solar modulation and the propagation through interstellar medium is being obtained from a comparison of this data with that already available.

539.7223

651.379 Rambhad, Kishore Raghavendra. X-ray absorption edge of Fe in various chemical compounds. Bombay, Institute of Science, 1964-67. Bhide, V. G., Professor and Head of the Department of Physics.

The changes in the K.X-ray absorption edge for Fe in its various compounds are being investigated with the help of a 20 cm. bent crystal X-ray spectrograph. The degree of covalency determined from these shifts will be compared with the isomer shift systematics in Mossbauer spectra.

539.7222

652.380 Sreenivasan, N. Intensity of primary cosmic ray nuclei. Bombay, Tata Institute of Fundamental Research, Bombay, 1963-67. Biswas, S., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

The intensities and energy spectra of low energy multiply charged primary cosmic ray nuclei have been obtained. From the measured ratios of Li (C, N, O, F) and He^3/He^4 nuclei, the amount of matter traversed by cosmic ray nuclei in space and its energy dependence have been derived.

539.7223

653.381 Subrahmanya Sastry, Chaturvedula. Measurement of radioactivity and its application to problems in solid state physics. I.I.T., Madras, Physics, 1964-67. Sivaramakrishnan, Venkatesa, Asstt. Professor.

It is proposed to study the design and fabrication of detectors for the measurement of very low α and β activities, the radioactivity of the rocks and minerals, and the determination of their ages by various methods of geochronology, and the diffusion in powder compacts (polycrystalline metals and alloys) by tracer methods.

539.722

Particle Acceleration

654.382 Raychaudhuri, Arunkumar. Nuclear magnetic resonance study in liquids and solids. Calcutta, Physics, 1965-67. Ray, D. K.

539.733

655.383 Tripathi, Shambhoo Nath. Study of the function of the collecting electrode in a Van de Graaff generator, B.I.T.S., Pilani, Physics, 1966-72. Subudhi, K. S., Asstt. Professor.

It is proposed to study the characteristics of Van de Graaff generator as dependent on various parameters like the size of the terminal, distance of the terminal from the ground potential and similar other factors. It is also proposed to test the Simon's theory on the voltage of Van de Graaff generator.

539.732

656.384 Udaya Shankar Rao, V. Nuclear magnetic resonance study of solids. Bombay, Tata Institute of Fundamental Research, Bombay, 1961-67. Thosar, B. V., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

Nuclear magnetic resonance knight shifts have been measured in platinum alloys to determine the effect of alloying on the band of platinum, and in rare-earth-tin and uranium-tin alloys to study the conduction electron polarization by localized spins. The results will be discussed in the light of current theories.

539.733

Nuclear Structure

657.385 Agarwal, Y. K. Measurement of magnetic moments of excited nuclear states and nuclear structure studies. Bombay, Tata Institute of Fundamental Research, 1961-67. Bhattacharjee, S. K., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

The magnetic moments of excited nuclear states in Ta^{181}, Cs^{133}, Tm^{171}, Sm^{152}, As^{75}, Pb^{211}, Pt^{192} and Pt^{194} have been measured by perturbed angular correlation methods using internal and external magnetic fields. The results have brought out certain important effects in nuclear structure like quenching of nucleon magnetic moments, core polarization in certain regions and importance of microscopic structure in vibrational levels.

539.74

658.386 Das, Bimalkumar. On the electronic structure spectra and reactivity of some II electron systems. Calcutta, Physics, 1965-67. Chanda, A. K.

539.744

659.387 Nigam, Aswinikumar. Studies in nuclear spectroscopy. Calcutta, Physics, 1962-67. Saha, S. K., Professor, Saha Institute of Nuclear Physics, Calcutta.

539.744

660.388 Ojha, Sant Prasad. A study of the frequency spectra of disordered lattices. Banaras, Physics, 1966-68. Sah, P., Reader.

The problem of the frequency spectra of disordered lattices in one and higher dimensions will be considered using the numerical technique developed by Dean in 1959 and the analytical method of phase theory as enunciated by Hori in 1966.

539.744

661.389 Rizvi, Mohammad Abul Hashim. Some studies in the nuclear optical model. Aligarh, Physics, 1965-68, Khan, Zillur Rahman, Reader.

It is proposed to use the fermi gas model of nucleus to predict the strength of the optical potential as a function of energy, and to obtain the radial distribution of the potential. The proposed study is also expected to predict the (N-Z) dependence of potential.

539.74

662.390 Srivastava, K. P. Electronic energy spectra in disordered lattice structures. Banaras, Physics, 1966-68. Sah, P., Reader.

It is planned to use the Green's function method and that of transfer matrices to study the electronic energy levels in a random lattice with special emphasis on disordered Kronig-Penney models.

539.744

Nuclear Reactions

663.391 Bhattacharya, Purabi. Interactions in nuclear matter. I. I. T., Kharagpur, Physics & Meteorology, 1966-69. Khanna, K. M., Lecturer.

The behaviour of a nuclear system is being studied at very low temperatures in the approximation that the infinite nuclear matter is composed of an equal even number of protons and neutrons and that these cluster into interacting alpha particles. It is proposed to establish the nature of alpha-alpha interaction.

539.75

664.392 Bhutani, Kewal Kant. Spectra of gases excited by proton bombardment. Allahabad, Applied Physics, 1962-67. Ghosh, Satyendra Nath, Professor and Head of the Department.

Low energy protons have been made to bombard various gases, like N_2, A, air and O_2. The spectra excited by such bombardments have been studied spectroscopically, photometrically and microphotometrically.

539.75

665.393 Chattopadhyay, Tapan Kumar. Radiation damage in solids. I. I. T., Kharagpur, Physics & Meteorology, 1966-70. Sharma, J., Asstt. Professor.

A low temperature dewar is being constructed with arrangements for bombarding the sample with low energy electron beam and soft X-rays. The electron gum and the X-ray tube are being fabricated.

539.75

666.394 Choudhari, Kashinath Nagesh. Study of K-interactions and hyperfragments. Bombay, Tata Institute of Fundamental Research, Bombay, 1965-67. Swami, M. S., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

K^--interactions, in general, and mesic decay of hyperfragments, in particular, are being studied. It is expected to arrive at important conclusions concerning basic Λ°-N interactions in hypernuclei and final state interactions present in the decay products of hypernuclei.

539.75

667.395 Dasgupta, Anilranjan. Studies on the interaction of gamma rays with matter. Calcutta, Physics, 1964-68. Ghosh, A. M., Professor.

539.7524

668.396 Dhawan, Madan Mohan. Studies of hypernuclei. Kurukshetra, Physics, 1966-69. Yog Prakash, Professor, Jammu & Kashmir University.

539.76

669.397 Ghosh, Sudipkumar. Structural effects in fast neutron reactions. Calcutta, Physics, 1966-68. Chatterjee, Apares, Reader, Physics, Jadavpur University.

539.75

670.398 Gilra, Narendra Kumar. Some problems on nuclear emulsion in high energy physics, Roorkee, Physics, 1964-67. Varshneya, N. C., Reader.

Crystal density in supercooled radiation detector. NIM. 40 ; 1966 : p. 238-240.

539.76

671.399 Goel, S. P. Studies of hypernuclei. Kurukshetra, Physics, 1966-68. Yog Prakash, Professor, Jammu & Kashmir University.

539.76

672.400 Gunye, Moreshwar Ramchandra. The characteristic properties of the deformed nuclei as explained by the quadrupole plus binary force theory. Bombay, Tata Institute of Fundamental Research, Bombay, 1964-66. Gupta, K. K., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

539.75

673.401 Gupta, Santibrata. Collision of electrons with atoms. Calcutta, Physics, 1963-67. Basu, D., Reader, Indian Association for Cultivation of Science, Calcutta.

539.753

674.402 Gurtu, Atul. Study of hyperfragments. Panjab. Physics, 1966-69. Swami, M. S., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

32 out of a stack of 150 G-5 plates exposed to 350 MeV/cK^- have been scanned and 45000 stopping K^- with at least one black prong have been recorded. Out of these, 1215 hyperfragments have been found, of which 360 are mesic hyperfragments. These have been analysed and the data has been sent to the Tata Institute of Fundamental Research for the estimation of binding energies at the computer installed there. A probable case of π^+ decay of a hyperfragment has also been found.

539.75

675.403 Jha, Rameswar. Electron atom collision. Calcutta, Physics, 1964-67. Basu, D., Reader, Indian Association for Cultivation of Science, Calcutta.

539.753

676.404 Kaul, Chaman Lal. Interactions of hyperons with nuclei. Jammu & Kashmir, Physics, 1966-69. Raina, N. N., Reader and Head of the Department.

Strangness 2 hyperons, predicted by Gell-mann, have been indentified. Recently the Cern and Brookhanan machines have been able to supply them in significant numbers. Emulsion technique has made it possible to study their interactions even in a small place and at a small cost. The study of double hyperfragments expected can throw light on hyperon-nucleon potential.

539.75

677.405 K. G. Prasad. Study of the excited states of some nuclei in the mean spherical region. Bombay, Tata Institute of Fundamental Research, Bombay, 1964-68. Thosar, B.V., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

The study of the excited states of near closed shell nuclei $^{115}_{49}In$, $^{117}_{49}In$, $^{109}_{47}Ag$, $^{111}_{47}Ag$, $^{197}_{78}mPt$, $^{197}_{79}Au$ and $^{199}_{79}Au$ is being made using radioactive isotopes and coulomb excitation methods with improved experimental techniques. Some investigations of K-shell ionisation produced by alpha particle bombardment on deformed nuclei have also been made.

539.75

678.406 Kulkarni, Vinayak Gopal. The study of positronium decay. Bombay, Tata Institute of Fundamental Research, Bombay, 1964-67. Thosar, B. V., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

The technique of measuring lifetime of positrons has been used successfully to study the radiation damage in irradiated polymers. Further studies of magnetic properties of solids, using the same technique, and investigations of the fermi surface of metals using the method of angular correlation of annihilation quanta are in progress.

539.75

679.407 Mangal, P. C. Investigations on the decay of some radioisotopes in the medium weight region. Panjab, Physics, 1964-67. Trehan, P. N., Reader.

Investigations on the decay of some radioisotopes in the medium weight region are being carried out using scintillation spectrometers in different modes of operation, such as, simple slow fast method, sum coincidence method, sum peak coincidence method etc., to determine the nuclear characteristic parameters, such as, Er, E_B, spin, parity, mixing ratios etc., and to have a better understanding of nuclear structure.

539.752

680.408 Matta, Mohan Lal. Measurement of quadrupole moments of excited states of nuclei. Kurukshetra, Physics, 1966-70. Hans, H. S., Professor and Head of the Department.

It is proposed to measure the perturbed γ-γ angular correlation in case of the nuclei which when in excited state are deformed from spherical shape. The perturbation may be achieved by embedding the nuclei in some single crystal.

539.76

681.409 Mukhopadhyay, Nimaichand. Neutron interactions with nucleus. Calcutta, Physics, 1966-69. Chatterjee, Apares, Reader, Physics, Jadavpur University.

539.75

682.410 Padmavathi, Sumangali Venkatesa. Study of high energy interactions caused by π^- mesons in emulsion nuclei. Osmania, Physics, 1964-68. Kamal, A. A., Lecturer.

700 electron pairs have been obtained by scanning G_5 pellicles exposed to 17 GeV/Cπ^- beam. The distribution of the parameters involving pair energy, opening angle and partition energy has been obtained and it is found to conform to Olsen's theory. An experiment has also been performed to investigate the behaviour of ionization curve in the relativistic region.

539.76

683.411 Parveen. Study of decay schemes. Punjab, Physics, 1966-69. Trehan, P. N., Reader.

The study is concerned with the decay schemes of certain doubtful nuclei regarding energy levels, spins, parties etc. work will also be done on Ba^{140}.

539.75

684.412 Prema, K. Studies on strange particle interactions. Madras, Physics, 1966-69. Bhamathi, G., Reader.

Theoretical calculations for the decay rates of two-body and three-body modes of ${}_{\Lambda}H^3$ & H^4 have been worked out using wave functions (two-body) obtained from a separable potential model. Comparison with experimental results is under investigation. Calculation of the decay rates of the above hyperfragments using three-body model wavefunctions is being made.

539.75

685.413 Rajagopalan, Govindaraja. High sensitivity radiation counting and its applications to some problems in nuclear geophysics. Bombay, Tata Institute of Fundamental

Research, Bombay, 1964-68. Devendra Lal, Professor, Tata Institute of Fundamental Research, Bombay.

A better limit on the half life of Ca-48 has been obtained with the help of counter with extremely low background. This is considered to be a significant contribution to the field of low level counting. A search for other long-lived radioisotopes is continuing.

539.75

686.414 Rajput, Mojam Singh. A study of decay schemes and angular correlation of gamma rays of radioactive isotopes using scintillation and proportional counter techniques. Aligarh, Physics, 1963-67. Sehgal, M. L., Reader.

Decay schemes and gamma-gamma angular correlation in the decay of the radioactive isotopes Nd^{147}, Sb^{125}, Gd^{153}, Sm^{153}, Ce^{144} and W^{187} have been studied. Further studies on some other isotopes are in progress.

539.7524

687.415 Rangwala, Abbas A. Some investigations in the theory of strong interactions of elementary particles. Bombay, Tata Institute of Fundamental Research, Bombay, 1965-67. Udgaonkar, B. M., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

Strong and Intermediate Coupling theories are being studied with emphasis on uniqueness of mass formulae, lie group dynamical generation of the extra internal symmetry for a class of representations, and intermediate coupling models for the hyperon isobars.

539.76

688.416 Rukmini, Bindingnavale Krishna Iyengar. Study of interactions caused by pions and protons in nuclear emulsions. Osmania, Physics, 1965-68. Kamal, A. A., Lecturer.

Three hundred and thirty one stars caused by a beam of 17.2 GeV/cπ^- have been found by along the track scanning. Some of the properties of three prong events have been studied. Observations have also been made on medium energy deuteron yield in proton and pion interactions. The results of strange particle production in pion nucleus interactions are being finalised.

(1) Nu. Cim. 43(1) ; 1966 : p. 91 ; and (2) Proceedings of the 9th Symposium on Cosmic Rays, Elementary Particle Physics and Astrophysics held at Bombay in 1965. p. 577.

539.75

689.417 Triyug Singh. Study of hyperfragments. Kurukshetra, Physics, 1966-69. Sharma, A. P., Reader.

The decay modes of non-mesonic hyperfragments are being studied theoretically by montocarlo calculation.

539.75

690.418 Usmani, Qamar Naseer. Some studies in direct nuclear reactions. Aligarh, Physics, 1965-68. Khan, Zilur Rahman, Reader.

It is proposed to analyse some two-particle transfer reactions. The existing theories do not account for the data satisfactorily.

539.75

691.419 Varshney, Rajendra Prashad. Investigation of the properties of the excited levels of the radioactive nuclei. Aligarh, Physics, 1964-67. Sehgal, M. L., Reader.

The decay scheme, gamma-gamma angular correlation and beta-gamma correlation of various cascades, following the decay of Se^{75} and Ho^{166} have been studied and the investigations on various other radioactive isotopes are in progress.

539.752

692.420 Venkateswar Rao, Y. Investigation into interactions caused by 17.2 $GeV/c\pi^-$ in emulsion nuclei. Osmania, Physics, 1962-66. Kamal, A. A., Lecturer.

Using the technique of 'along the track' scanning, about 1600 interactions have been detected. With usual selection criteria they have been separated out into pion-nucleon and pion-nucleus interactions. Various parameters, such as, transverse momentum with special reference to production of isobars, energy distribution and angular distribution have also been obtained.

(1) Proceedings of International Conference on Nuclear Photography, CERN held at Geneva in 1964. 2 : p. 6-53 ; (2) Nu. Cim. 32 ; 1964 : p. 836 ; and (3) Production of deuterons and tritons. ibid. 1966.

539.75

Paricle Detection & Measurement

693.421 Abhyankar, Shreedhar Shankar. Design and fabrication of a polarization transformer for the measurement of helicity of beta particles. Indore, Physics, 1964-67. Bhiday, Madhao Ramchandra, Professor and Head of the Department of Physics, G. S. T. Institute, Indore.

Experiments involving the polarized electrons yield information about 'g' factor, properties of nuclear levels, and ratios of matrix element. These experiments will be conducted to verify polarization with Z and polarization with energy. Experimental equipment regarding wien-filter as polarization transformer, scattering chamber for mott scattering, and detection system for L-R assymetry has been fabricated.

539.77

694.422 Agarwal, Vinay Kumar. Nuclear instrumentation construction of a particle detector. Roorkee, Physics, 1963-68. Varshney, N. C., Reader.

The detector is based on the principle of homogeneous nucleation of supercooled water. Ice crystals are formed in the supercooled liquid along the path of radiation.

539.776

695.423 Chaubey, Ashok Kumar. Measurement of isomeric cross section ratios for intermediate energy neutrons. Aligarh, Physics, 1963-67. Sehgal, M. L., Reader.

(n, γ) cross sections have been measured at 24 KeV for about 50 nuclei. These values of cross sections have been substituted in the expression of capture cross section obtained from statical theory of nuclear reaction. From these calculations, a parameter $\xi = D/2\pi\Gamma r$ has been obtained and compared with the ξ obtained from low energy resonance parameters. It is found that the statical theory holds good at this energy for all the types of nuclei.

Neutron activation cross section at 24 KeV. Nucl. Phys. 66;1965: p 267.

539.77

696.424 Gambhir, Yogendrakumar. Quasiparticle method and nuclear collective states. Calcutta, Physics, 1964-67. Pal, M. K., Professor, Saha Institute of Nuclear Physics, Calcutta.

539.77

697.425 Gupta, L. C. Nuclear quadrupole resonance studies in solids. Bombay, Tata Institute of Fundamental Research, Bombay, 1963-67. Bhattacharjee, S. K., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

Pure quadrupole resonance signals of Cl^{35} have been observed and recorded with an instrument assembled here. Signals of Br^{81} have also been observed with another assembled instrument which is under modification. The preparation of some of the compounds to be studied is in progress.

539.77

698.426 Mathur, Rajeshwari Prashad. The measurement of reaction cross section for short-lived isotopes at 14.8MeV neutron energy. Aligarh, Physics, 1964-67. Sarkar, D. C., Reader.

Actuation cross sections for the reaction that leaves the activet residual nucleus can be measured by following the activites produced in a sample by the neutron bombardment. These measurements are difficult when the half-life of the nucleus lies between .1 sec. and a few minutes. For these measurements special electronic circuits have been designed and used. These measurements are expected to give valuable information about the reaction mechanism.

539.77

699.427 Mishra, Umesh Chandra. Radioactive fallout studies using scintillation spectrometry. Bombay, Atomic Energy Establishment, Trombay, 1965-67. Rao, A.S., Director, Electronics Group, Atomic Energy Establishment, Trombay.

A 256-channel pulse height analyser coupled to a 5″ dia. × 4″ thick NaI (Tl) crystal inside 6″ lead shield has been set up. Programme for data processing on CDC-3600 has been written. About 20 samples of Bombay soils have been analysed for their fallout radioactivity. Samples from country-wide stations are being collected and analysed.

539.775

700.428 Shamsul Hasan, S. Measurement of the cross sections with fast neutrons. Aligarh, Physics, 1966-69. Sehgal, M. L., Reader.

539.77

701.429 Somayajulu, B. L. K. Processes using naturally occuring radio nuclides. Bombay, Tata Institute of Fundamental Research, Bombay, 1962-68. Devendra Lal, Professor, Tata Institute of Fundamental Research, Bombay.

Some techniques for separating trace elements from ocean water have been perfected and the disequilibrium among the members of U-Th series in the sea water and recent volcanic rocks has been studied. The cause and implications of the observed disequilibrium and similar phenomena in other geophysical domains are being investigated.

539.77

702.430 Subhash Chandra. To measure spin-lattice and spin-spin relaxation times by the spin-echo technique. Aligarh, physics, 1964-67. Sarkar, D. C., Reader.

A nuclear spin-pulse apparatus, capable of giving any sequence of 90° and 180° intense r.f pulses, has been designed and assembled to measure the relaxation times of protons by the spin-echo technique. To calibrate the apparatus the relaxation times of protons in glycerine would be measured.

539.77

703.431 Sundaram, Sankara Subba Iyer. Studies on nuclear geology. I.I.S., Bangalore, Physics, 1965-68. Venkatasubramanian, V. S., Asstt. Professor.

Radioactive disequilibrium studies on some minerals and rocks are being carried out by gridded ionisation chamber alpha spectrometry. The time relationships reflected by the abundance variations of the daughter nuclides of the radio-active families provide useful clues to the study of the geochemical process involved in the migration of elements. Age determination of rocks and minerals by mass spectrometry for some precambrian specimens of Dharwar region is also being attempted.

539.772

704.432 Surendra Pal. Nuclear geology. I.I.S., Bangalore, Physics, 1965-68. Venkatasubramanian, V. S., Asstt. Professor.

The distribution of U and Th and their behaviour during metamorphic differentiation, and the K/Rb ratios in related suites of rocks and their petrogenetic behaviour are being investigated. The dating of various precambrian specimens belonging to the Dharwar region by the Sr-method (both Rb/Sr and isochron) is being done with the help of a mass spectrometer using isotope dilution technique.

539.772

705.433 Tandon, P.N. Measurement of 'g' factors of excited states of nuclei. Bombay, Tata Institute of Fundamental Research, Bombay, 1963-67. Thosar, B. V., Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

The 'g' factors of excited state of nuclei have been measured in some nuclei using gamma-gamma angular correlation technique. This technique is also used in measuring internal fields at impurity nuclei in a ferromagnetic lattice.

For Geophysics 539.77

See

GEOLOGY.

CHEMISTRY

Physical and Theoretical Chemistry

706.1 Sengupta, Asis Chandra. Studies in the co-ordination chemistry using chelate ligands. Burdwan, Chemistry, 1965-68. Siddhanta, Sushil Kumar, Professor.

The work pertains to the studies of complex compounds of metal ions with bi- and polydentate ligands, particularly, those having nitrogen donors and free COOH groups. The ligands used are the condensation products of different amines and amino acids with keto acids.

541

Molecular Structure

707.2 Basu, Swapankumar. Optical and magnetic studies on metal chelates. Calcutta, Pure Chemistry, 1964-68. Basu, S., Professor.

541.2253

708.3 Chowdhry, Hira Chand. Stereochemistry of complexes. Vikram, Chemistry, 1966-70. Bakodia, M. M., Reader.

541.223

709.4 Dasgupta, Manotosh. Studies on some metal chelating agents containing sulphonomide group. Calcutta, Pure Chemistry, 1964-67. Ghosh, N. N., Lecturer.

541.2253

710.5 Gandhi, M. H. Absorption spectra and chemical structure. Gujarat, Chemistry, 1962-67. Vaidya, B. K., Professor.

Absorption spectra of 'single' and 'double' aliphatic molecules are being studied to observe the insulating effect and the solvent effect of methylene group. Several o-hydroxyketoximes are also being studied for their chelating properties.

541.22

711.6 Seshagiri, Vahi. Metal complexes in analytical chemistry : A physico-chemical study. Venkateswara, Chemistry, 1963-66. Brahmaji Rao, Sukur, Lecturer.

Polarographic, spectrophotometric and megnotometric studies have been made of chelates of metals with derivatives of resacetophenone in aqueous—non-aqueous mixtures. These investigations have been taken up with a view to correlate the structure with stability of the complex.

(1) Proc. IAS. 52A ; 1965 : p. 231 ; and (2) Curr. Sci. 35 ; 1966 : p. 202.

541.2253

712.7 Syamal, Arunsankar. Studies in co-ordination complexes. Burdwan, Chemistry, 1964-66. Dutta, Rabindra Lal, Reader.

Diamine, dipyridine, di-β-picoline, diacetonitrile, dicyano, dinitro bis, 1-amidino-O-alkylurea cobalt (III) complexes have been prepared and characterised. Mixed ligand complexes like orthophenanthroline, dipyridyl, ethylene diamine, glycine, biguanide bis, 1-amidino-O-alkylurea cobalt (III) have been isolated and characterised. 1-amidino-O-alkylurea bis biguanido cobalt (III) have also been prepared and characterised. The geometrical and optical isomerism of these complexes have been studied in detail. Square-planer cobalt (II)-1-amidino-O-alkylurea complexes will also be studied.

JINC. 27 ; 1965 : p. 2447.

541.2252

Polymers

713.8 Karunakaran, Kamaraj. Studies in high polymer system. Madras, Physical Chemistry, 1962-66. Santappa, M., Professor.

The solution properties of high polymers, homopolymers as well as copolymers are being investigated by making use of techniques like light scattering, viscometry and osmometry. The molecular weight, end to end dimension, and the limiting viscosity number of the polymer have been found out in various solvents and analysed.

Polyethylmethacrylate in dilute solution. Curr. Sci. 33 ; 1964 : p. 551.

541.2254

714.9 Kausalya, M. Polymer systems in solution. Madras, physical Chemistry, 1966-69. Santappa, M., Professor.

547-2254

715.10 Prabhakara Rao, Satyavolu. Synthesis and reactions of some polymers in solution. Madras, Physical Chemistry, 1964-67. Santappa, M., Professor.

Synthesis and study of graft copolymers has been undertaken. Synthesis is being carried out by chain transfer reaction, the grafting efficiency and chain transfer constant for each system being evaluated. Viscosity, osmotic pressure, or light-scattering measurements have been carried out on graft polymers to obtain number of branches etc.

Graft co-polymerization by chain transfer. Curr. Sci. 36 (6) ; 1965 : p. 176.

541.2254

716.11 Sarkar, Dilipkumar. Studies on solution properties of polymers. Calcutta, Chemistry, 1964-68. Palit, S. R., Professor, Indian Association for Cultivation of Science, Calcutta.

541.2254

717.12 Subramanian, Subbaraya Venkatasesha. Solution properties of high polymers. Madras, Physical Chemistry, 1964-67. Santappa, M., Professor.

Polymerisation kinetics of vinyl monomers in aqueous solutions initiated by ceric ion and also by redox systems with ceric ion as oxidant and reducing agents, such as, aldehydes, alcohols and acids are being carried out.

541.2254

See Also

PHYSICS, LIGHT, SPECTROSCOPY ;

PHYSICS, NUCLEAR PHYSICS, MOLECULAR STRUCTURE.

Stoichiometry

718.13 Makhni, Harbans Singh. Alkoxides and their co-ordination chemistry. Panjab, Chemistry, 1962-67. Paul, Ram Chand, Head of the Department.

Various chloro and chloride alkoxides of boron, silicon, aluminium and titanium have been prepared to study the effect of chlorine in the co-ordination chemistry of alkoxides. They have been found to give adducts with bases. The molecular weight studies shall be done to establish the nature of these alkoxides and their complexes.

541.26

719.14 Patel, Maganbhai Nathabhai. Studies on co-ordination comopunds. Patel, Chemistry, 1966-68. Patel, R. D., Head of the Department.

Four ketones have been prepared. Spectrophotometric method has been used for the conformation of Fe (II) complex. The pH-titrations have been carried out to find out the pk values. An attempt has also been made to find out from the pH-titrations, the stability constants of the complexes formed by the above ketones and some of the transition metals.

541.26

720.15 Patel, Ratilal Prabhudas. Studies on co-ordination compounds. Patel, Chemistry, 1965-68. Patel, R. D., Head of the Department.

Propiophenone and list oxime have been prepared and used with the transition metal ion to determine the stability constant by potentiometry titration. This data of stability constant will be confirmed by spectrophotometry and polarography.

541.26

721.16 Raghavan, K. S. The interaction of metal ions with peptides and similar molecules. Bombay, National Chemical Laboratory, Poona, 1963-67. Biswas, A. B., Head, Physical Chemistry Division, National Chemical Laboratory, Poona.

The association of Cu(II), Ni(II), Zn(II), Co(II), Fe(II), Mn(II) and Cd(II) with histidine, histidyl histidine, carnosine and glycyl tyrosine has been investigated at 2°C, 25°C and 40°C. Using these stability constant data, thermodynamic functions, such as, $\triangle F$, $\triangle H$ and $\triangle S$, for these associations have been calculated. Spectrochemical data of these systems have also been collected.

541.26

722.17 Saxena, Umesh Babu. Studies on the reactions of silicon, titanium and zirconium alkoxides with some polydentate ligands. Rajasthan, Chemistry, 1964-67. Mehrotra, Ram Charan, Head of the Department.

The reactions of titanium alkoxides with bis (acetoacetates) in various molar ratios have been carried out and the displacement reactions of the above product (1 : 0.5) with β-diketones and β-ketoesters have also been done. Alcoholysis reaction of above bis (acetoacetate) derivatives have also been done. Reactions of Si-alkoxides and acetoxysilane with bis (acetoacetate) have also been done.

541.26

723.18 Shah, Jayantkumar Ramanlal. Studies on co-ordination compounds and their stabilities formed by the various ketones. Patel, Chemistry, 1966-68. Patel, R. D., Head of the Department.

Five ketones have been prepared to study their 'pk' coordination with some transition metals and stabilities by pH metry method. The stability constant will also be confirmed by other methods like spectrophotometry, polarography etc.

541.26

Quantum Chemistry

724.19 Prem Paul Singh. Statistical mechanics of liquid mixtures. Kurukshetra, Chemistry, 1966-69. Nigam, R. K., Lecturer.

Excess functions on mixing have been deduced from the experimental measurements on volume change on mixing for different mixtures of non-electrolytes. Statistical theories of solutions have been critically reviewed in the light of intermolecular forces in the mixtures of non-electrolytes.

541.28

725.20 Sen, Purnendunath. Applications of quantum mechanical methods to chemical problems. Calcutta, Pure Chemistry, 1965-67. Basu, S.

541.28

Solutions

726.21 Chickerur, Nagendranath Srinivasa. Physical chemistry. Banaras, Chemistry, 1966-68. Narasaraju, T. S. B., Lecturer.

Hydroxyapatite, $3Ca_3(PO_4)_2 \cdot Ca(OH)_2$, is the inorganic constituent of human bones and teeth. This compound undergoes cationic exchange (Ca^{2+}-Sr^{2+}). It is intended to prepare a series of solid solutions of Ca- and Sr-hydroxyapatites in order to investigate the dependence of the solubility of these solid solutions on (i) pH and (ii) proportion of Sr-hydroxyapatite. These investigations are expected to throw light on the incorporation of radioactive Sr in human skeletal system as a result of atomic explosions.

541.34

727.22 Chandraiah Chowdary, Mannam. Physical properties of solutions. Venkateswara, Chemistry, 1965-68. Rama Krishnan, Vattarmadom, Reader.

The problem deals with the studies in binary liquid mixtures with reference to the excess thermodynamic functions viz. excess volume and excess polarization. These are being evaluated from the densities and the dielectric constants of the pure components and the mixtures. The data on these excess functions will be analysed in terms of intermolecular forces.

541.341

728.23 Lakshminarayana, Kalahasti. Studies in properties of salt solutions in non-aqueous media. Venkateswara, Chemistry, 1959-66. Rama Krishnan, Vattarmadom, Reader.

The following properties are being studied with the salts in non-aqueous acetic acid as solvent : (1) Partial molal volumes, (2) Compressibilities from ultrasonic measurements, and (3) Magnetic susceptibilities.

541.3423

729.24 Pramanik, Anandagopal. Studies in solution properties of starch kanthalio. Calcutta, Chemistry, 1964-68. Chaudhuri, A. K.

541.341

730.25 Raman, Gorjala Kodanda. Studies in physico-chemical properties of liquid mixtures. Venkateswara, Chemistry, 1965-68. Rama Krishnan, Vattarmadom, Reader.

The problem relates to the measurement of physical properties, such as, density, viscosity and compressibilities. From these properties the excess thermodynamic properties, such as, excess volumes, partial molal volumes and excess compressibilities will be calculated. These are expected to throw light on the nature of the interactions in the liquids.

541.341

731.26 Sarma, T. Syamasundara. Thermodynamic properties of high temperature aqueous solution. I. I. T., Kanpur, Chemistry, 1965-69. Ahluwalia, J. C., Asstt. Professor.

An apparatus has been set up to measure the heats of solution at different temperatures using thermistor as the sensing device alongwith amplifier and potentiometer etc. Determination of partial molal heat capacities of tetralkyl-ammonium halides from 0°C to 100°C is in progress. The results obtained will be of great importance in determining the influence of these ions on water structure at different temperatures.

541.3416

732.27 Shil, Shruti Kumar. Studies on the properties of binary liquid mixtures. I. I. T., Delhi, Chemistry, 1964-67. Katti, P. K., Assoc. Professor.

Interaction between unlike molecules (non-polar+polar) is being studied by measuring isothermal compressibilities and viscosities of binary liquid mixtures of CCl_4 and C_6H_6 with CH_3OH, C_2H_5OH and iso-C_3H_7OH in the temperature range of 25°C to 70°C. Most of the measurements have been completed on experimental set up fabricated for the purpose.

541.341

733.28 Subramanian, S. Thermodynamic properties of high temperature aqueous solutions. I. I. T., Kanpur, Chemistry, 1965-69. Ahluwalia, J. C., Asstt. Professor.

An apparatus has been set up to determine heats of solution at different temperatures using thermistor as the sensing device alongwith amplifier and potentiometers with a temperature control of ± ·005°. Partial molal heat capacities of sodium tetraphenyl boron from 0°C to 100°C have been determined. The results will throw light on the influence of this compound on water structure at different temperatures.

541.3416

Colloidal Chemistry

734.29 Jayantilal, Sudhir. Studies in colloids. Gujarat, Chemistry, 1960-67. Trivedi, A. M., Reader.

A new colloidal solution of negatively charged iron oxide has been prepared and its various properties, like coagulation value, membrane equilibrium, electrical conductance, viscosity etc., are being studied.

541.345

735.30 Patani, Puranchand Joshingbhai. Studies of colloidal solutions. Gujarat, Chemistry, 1960-67. Trivedi, A. M., Reader.

A colloidal of $BaSO_4$ and $Al(OH)_3$ has been prepared and its properties, like coagulation value, effect of organic reagents, conductivity, Donnan membrane equilibrium etc., are being studied.

541.345

Surface Chemistry

736.31 Beg, Mohd. Nasim. Studies on membrane phenomena and sol-gel transformation. Aligarh, Chemistry, 1966-69. Siddiqi, Fasih A.

541.3453

737.32 Chowdhuri, Ajit Kumar. Study of the electrical properties of tellurium film deposited on different substrate. I. I. T., Kharagpur, Physics & Meteorology, 1961-67. Bose, H. N., Professor and Head of the Department.

The variation of conductivity with temperature for films of different thickness has been studied. It is found that the rate of variation depends on the structure of the film. Film Structure has been studied under electron microscope and the variation of Hall-coefficient with temperature determined. It is observed that the behaviour of the film in vacuum and in air is entirely different.

Hall mobility of tellurium deposited on $BaTiO_3$ single crystals. Ind. Jour. Phys. 39 : Apr.'65.

541.3453

738.33 Joshi, Shashikant Bajirao. Study of the solid surfaces by radiochemical isotopes. Poona, Chemistry, 1964-68.

Arnikar, Harirao Jeevan, Professor and Head of the Department.

Adsorption of cations on glass surface has been studied by using Sr^{90}, Ca^{45} and Ba^{131} radioisotopes. Desorption of iodide from glass surface has also been studied by using I^{131} as an isotope. Surface self-diffusion of S^{35}, P^{32} on Ag surface and of the cation, on glass surface will be continued in diffusion section.

Proceedings of Nuclear and Radiation Chemistry, A.E.E.T. 1966. p.327-336.

541.3453

739.34 Kartar Chand. Surface chemistry (gas-solid) interactions. I.I.T., Delhi, Chemistry, 1965-68. Ramakrishna, V., Professor and Head of the Department.

The work is being done on the adsorption of gases on metal oxide surfaces.

541.3453

740.35 Nagendra Singh. Studies on electrocapillary phenomena and structure of electrical double layer. Banaras, Chemistry, 1965-67. Ramanamurti, M. V., Reader.

The data for electrocapillary curves and double layer capacity vs. potential curves obtained by A.C. bridge method can be used to ascertain by thermodynamic means, (i) charge on a mercury surface in contact with an inert electrolyte, and (ii) the ionic components of that charge. These results provide a more detailed picture of the electrical double layer than had been obtained otherwise.

541.3453

741.36 Sindhu, Prithiwant Singh. Surface chemistry of clays. Delhi, Chemistry, 1966-69. Mitra, R. P., Professor and Head of the Department.

Bottle titration has been done of different clays of 1 : 1 layer lattice silicates and 1:2 layer lattice silicates which also include mica, montmorilonite, quartz and feldspar. C.V. measurements are in progress.

541.3453

Photochemistry

742.37 Kannan, *Srinivasa Desikan. Thermal and photochemical* studies in the liquid phase. Madurai, Chemistry, 1966-69. Subbaratnam, N. R., Reader.

The spectra and photochemical aspects of charge-transfer complexes are being investigated. Chemical transformations induced in the illuminated systems using visible and ultraviolet light have been studied and new free radical reactions observed. The induced free radical ractions in the liquid phase are found to follow a path different from that in the gas phase.

541.35

743.38 Vijayavalli, Rengaswamy. Polarisation studies of different metals in aqueous electrolytes. Madras, Central Electrochemical Research Institute, Karaikudi, 1965-68. Udupa, Handady Venkatakrishna, Scientist, Central Electrochemical Research Institute, Karaikudi.

Cathodic and anodic polarisation studies of metals, such as, nickel, cadmium, zinc, silver and iron in alkaline, neutral and acid solutions under galvanostatic, potentiostatic and potentiodynamic conditions have been undertaken. The influence of superposed A.C. and certain anions on the polarisation behaviour of the above metals under static and dynamic conditions will also be studied.

541.35

Thermochemistry & Thermodynamics

744.39 Chakrabartty, Dinesh. Chemical and thermodynamic properties of some refractory materials at high temperature. Bombay, National Chemical Laboratory, Poona, 1965-67. Dadape, V. V., Asstt. Director, National Chemical Laboratory, Poona.

Synthesis of refractory oxides, carbides and nitrides is being attempted upto 2500°C to study their non-stoichiometry. Thermodynamic properties of such compounds will be determined at 1000°-3000°C employing the Knudsen effusion technique in a vacuum microbalance unit. This data will indicate the stabilities of such compounds at high temperatures and in corrosive atmospheres.

541.369

745.40 Chattopadhyay, Chinnay. Thermodynamic and mechanistic studies on coordination. Calcutta, Chemistry, 1964-67. Banerjee, D., Reader, Indian Association for Cultivation of Science, Calcutta.

541.369

746.41 Gunjikar, Vishwanath Ganesh. Thermodynamic properties of mixed metal oxides with a perovskite structure. Bombay, National Chemical Laboratory, Poona, 1962-67. Biswas, A. B., Head, Physical Chemistry Division, National Chemical Laboratory, Poona.

A high temperature adiabatic calorimeter for the measurement of heat capacity of solids in the range 298°-600°K has been constructed. Heat capacity measurements are being made for various mixed metal oxides with a perovskite structure having a general formula : $Sr_2 (BB') O_6$, where B=Mo or W and B′=Ni or Co. Thermodynamic properties, such as, entropy, enthalpy and free energy have also been evaluated within the said range.

541.369

747.42 Gupta, Vijay Kumar. Thermodynamics of electrolyte solutions. Panjab, Chemistry, 1964-67. Jain, D.V.S., Reader.

It is proposed to set up the differential manometer for the measurement of lowering of vapour pressure by the strong electrolytes in acqueous as well as non-aqueous media. The isothermal phase-change calorimeter has also been set up to study the heats of solutions of electrolytes in non-aqueous solvents.

541.369

748.43 Kalyanaraman, R. Thermochemical studies on uranium and thorium compounds. Bombay, Atomic Energy Establishment, Trombay, 1963-66. Athavale, V.T., Head, Analytical Division, Atomic Energy Establishment, Trombay.

The heats of formation of some uranium and thorium compounds have been determined through bomb and solution calorimetry. Thermodynamic quantities associated with the sublimation process of these compounds have been found out. Some metal-donor bond energies in them have been calculated. U=O, Th=O bond energies and $\triangle H_{sub}$ U_3O_8 (S) have also been found out.

541.36

749.44 Suri, Sushil Krishan. Thermodynamics of solutions. I.I.T., Delhi, Chemistry, 1964-67. Ramakrishna, V., Professor and Head of the Department.

Studies on the thermodynamic properties of binary and ternary compounds are in progress. The major aspects proposed to be covered are measurements of volumes of mixing, heats of mixing, surface tension, solubility and the determination of phase diagrams.

541.369

Electrochemistry

750.45 Bapat, Manohar Ramchandra. Structure of electrical double layer. Bombay, Institute of Science, 1964-67. Joshi, K.M., Asstt. Professor.

The structure of electrode double layer is being investigated by the electrocapillary method. Effect of surface active agents will also be examined.

541.372

751.46 B. Singh. The study and development of lead secondary phosphate electrode. I.I.T., Kanpur, Chemistry, 1966-69. Kamla Parsad Singh, Asstt. Professor.

The thermodynamics of the cell $H_2(P+)$, $H_3PO_4(m)$, $PhHPO_4$-PhO_2 $(P+)$ will be determined in the temperature range 0°C to 60°C and composition range 0.001_m to 6_m acid.

541.3724

752.47 Das Gupta, Dhruba. Absorption of u.h.f. radiowaves and microwaves in organic liquids and opalescent binary mixtures. North Bengal, Physics, 1964-67. Sen, S.N., Professor and Head of the Department.

Large number of measurements have been made on the different physical properties of critically opalescent binary mixtures. It is proposed to find out the dielectric constant and loss in the r.f. and microwave region, and ultrasonic absorption of such mixtures. The results obtained will be correlated with existing theories.

541.372

753.48 Dhawale, S. W. Studies on electrical double layer. Bombay, Institute of Science, 1963-67. Joshi, K. M., Asstt. Professor.

The structure of electrical double layer at mercury solution interface is being investigated by the electrocapillary method. Applicability of several adsorption isotherms will also be studied.

541.372

754.49 Gangadhara Iyer, R. Kinetics and mechanisms of electrode processes. Kerala, Central Electrochemical Research Institute, Karaikudi, 1964-67. Devanathan, M. A. V., Scientist, Central Electrochemical Research Institute, Karaikudi.

The mechanism of electrodes of second kind, viz. Ag/AgCl, Ag/AgBr and Ag/AgI in KCl, KBr and KI solutions respectively is being investigated with the help of A.C. bridge technique. It is proposed to study the effect of ultraviolet spectra on the above electrodes.

541.3724

755.50 Garde, Sharad Laxman Rao. Studies in ion exchange behaviour of alkaline earth metal ions in non-aqueous and mixed solvents. Jiwaji, Chemistry, 1965-67. Bhatnagar, R. P., Asstt. Professor of Chemistry, Govt. Science College, Gwalior.

Ion exchange behaviour of alkaline earths in non-aqueous and mixed solvents has been studied to include (1) Equilibria under varied conditions ; (2) Kinetics from the point of view of the mass action and diffusion; (3) Effect of temperature to give thermodynamic data; (4) Effect of pH and swelling; and (5) Separation in mixed solvents.

Jour. Ind. Chem. Soc. 43 ; 1966 : p. 259-264.

541.3723

756.51 George, Arimpur Mathew. Electrical properties of defect oxides. Bombay, Atomic Energy Establishment, Trombay, 1964-67. Jagdish Shankar, Head, Chemistry Division, Atomic Energy Establishment, Trombay.

Apparatus for electrical conductivity, Hall effect and thermoelectric power measurement has been set up and calibrated. Studies on defect oxides, such as, those of uranium and zirconium have been initiated.

541.377

757.52 Jadhav, Pratap Kashinath. Activity coefficients in mixed solutions. Bombay, Institute of Science, 1964-67. Joshi, K. M., Asstt. Professor.

Activity coefficients of mixed electrolytes in aqueous solutions are being studied by the isopiestic method. 2 : 1 electrolyte with 1 : 1 electrolyte in mixture with common cation has been chosen for study.

541.372

758.53 Jangida, Bihari Lal. Ion-exchange equilibria involving thorium. Bombay, Atomic Energy Establishment, Trombay, 1964-67. Athavle, V. T., Head, Analytical Division, Atomic Energy Establishment, Trombay.

Equilibrium constants for the exchange reactions for 1, 2, 4, 8 and 12 per cent cross linked cation exchange (Dowex 50 w) resins with thorium ions in $0{\cdot}5_m$ hydrochloric acid at four different temperatures, 33°, 40°, 50° and 60°C, have been found out. Enthalpy values for each resin-thorium reaction have been computed from the slope of log equilibrium constant values Vs. $\frac{1}{T}$ plot. Free energy and enthalpy values have also been calculated for these reactions.

541.3723

759.54 Jindal, Harbans Lal. Electrochemical investigations in molten salts. Delhi, Chemistry, 1963-67. Gaur, Harish C., Reader.

Apparent standard electrode potentials of a number of metal ion-metal couples in molten $MgCl_2$-KCl have been determined. Polarographic behaviour of several cations in this solvent has also been studied.

541.3724

760.55 Juliana, M. Mary. Electrochemical studies of metal ions. Madras, Central Electrochemical Research Institute, Karaikudi, 1964-69. Suryanarayana, C. V., Scientist, Central Electrochemical Research Institute, Karaikudi.

Polarographic studies of metal ions, like those of copper, nickel, cadmium, lead, zinc etc., in various media, various supporting electrolytes and in ternary mixtures have been taken up.

541.3722

761.56 Kaul, Moti Lal. Conductivity of mixed electrolytes. Jammu & Kashmir, Chemistry, 1966-69. Bhattacharya, Abnai Kumar, Head of the Department.

Conductivity of mixture of different acids will be studied by measuring conductivity of the pure as well as the mixed acids. The variations in conductivity will be discussed and the deviations from the additive law observed. Attempts will also be made to arrive at some general conclusion and derive an expression, if possible, to correlate the results of mixed electrolytes.

541.3722

762.57 Krishnamoorthy Iyer, Raghupathy. Ion-exchange separation of rare earths in mixed solvents. Bombay, Atomic Energy Establishment, Trombay, 1964-67. Athavle, V.T., Head, Analytical Division, Atomic Energy Establishment, Trombay.

The separation of rare earths by anion exchange from nitric acid-methanol medium is being studied. The Kd measurements with lanthanum indicate that maximum absorption takes place from a mixture containing 10% of water, at higher concentrations of lanthanum. At lower concentration no maximum is observed.

541.3723

763.58 Kuppusami, J. Ultrasonics and other physico-chemical studies of electrolyte solutions. Madras, Central Electrochemical Research Institute, Karaikudi, 1964-69. Suryanaryana, C. V., Scientist, Central Electrochemical Research Institute, Karaikudi.

It is proposed to establish a correlation between the conductance minimum observed in certain electrolytes in media of low dielectric constant and other physico-chemical properties, like internal pressure (measured by ultrasonic method), viscosity etc. It is also proposed to extend this correlation to media of high dielectric constant and study the phenomenon of saturation of aqueous etectrolyte solutions.

541.372

764.59 Mitra, Arup Kumar. Electrometric measurements and their significance in systems of chemical interest. Burdwan, Chemistry, 1965-68. Rakshit, Sisir Chandra, Reader.

A study is being made of the behaviour of powder electrodes. A powder electrode consists of an insoluble powder with a platinum contact electrode completely immersed in an indifferent conducting electrolyte. It is proposed to establish a correlation between the potential values of the powder electrodes and the different surface properties, such as, kinetics, adsorption and promoter action.

541.37

765.60 Naqvi, Afsar. Investigation on the resistibility of electrode system. Aligarh, Chemistry, 1965-68. Khan, A. Aziz, Lecturer and Mathur, D. P. (Ex.).

541.3724

766.61 Negi, Ansingh. Electrochemistry in relation to structure. Delhi, Chemistry, 1965-68. Mitra, R. P., Professor and Banerjee, N. R., Lecturer.

Polarographic study of eosin is undertaken. Some work has been done in acidic and alkaline medium. Further investigation is in progress.

541.3722

767.62 Pal, Gopalchandra. Electrode potentials in non-aqueous solvents. Calcutta, Chemistry, 1964-67. Sengupta, M.

541.3724

768.63 Patel, Joitabhai Ramchand. A study of the solution properties of polyelectrolyte. Patel, Chemistry, 1965-68. Patel, R. D., Professor and Head of the Department.

A study of the solution properties of polyelectrolyte has been undertaken on the following lines. Starch has been prepared from potatoes by fractionation method. This is separated into two parts as Amylose and Amylopectin. The amylose fraction has been used in the preparation of (NaCMA) polyelectrolyte. Fractionation has been carried out of the polyelectrolyte for different molecular weights. The light scattering, viscosity and osmometry measurements are in progress for the detailed study of the solution properties of NaCMA.

541.372

769.64 Quraishi, Mohammad Iqbal. Electrometric studies of chemical interaction. Banaras, Chemistry, 1965-67. B. B. Prasad, Lecturer.

Studies of oxidation reduction reactions have been made by making use of platinum graphite electrodes. Iodine-thio-sulphate reaction in dilute range has been studied in detail. Use of polarised electrodes to different extents and their suitability for utilisation in estimation of small quantities of iodine have also been studied.

541.37

770.65 Ramasamy, N. Structure of electrified interfaces. Madras, Central Electrochemical Research Institute, Karaikudi, 1963-68. Devanathan, M. A. V., Scientist, Central Electrochemical Research Institute, Karaikudi.

An ellipsometric set up has been designed and assembled for chronoellipsometric and galvanostatic studies of anodic film formation. Experiments on anodic formation of calomel film on mercury pool electrodes are being conducted to calibrate the set-up.

541.3724

771.66 Rangarajan, N. Dielectric, ultrasonic and other studies of ternary liquid systems from the point of view of liquid-liquid miscibility. Madras, Central Electrochemical Research Institute, Karaikudi, 1964-69. Suryanarayana, C. V., Scientist, Central Electrochemical Research Institute, Karaikudi.

The purpose of the work is to understand the nature of the liquid state by studying the properties of ternary liquid systems where a homogeneous mixture is formed. The properties of interest are dielectric constant and dielectric loss at various frequencies, the adiabatic compressibility and the refractive index.

541.377

772.67 Saxena, Santosh Kumar. Electrical phenomena at interfaces. Aligarh, Chemistry, 1966-69. Siddiqi, Fasih A., Lecturer.

541.3724

773.68 Singhal, Gauri Nandan. Electrochemistry of fused salts. Delhi, Chemistry, 1966-69. Gaur, Harish C., Reader.

Constant current source, vacuum line and other apparatus have been assembled. Phase diagram study of the system $NaNO_3$-$Ba(NO_3)_2$ is being done.

541.3722

774.69 Trivedi, Ram Gopal. Studies in the exchange of univalent thallium, univalent silver and bivalent lead and bivalent mercury, with and without complexing agents. Jiwaji, Chemistry, 1965-67. Bhatnagar, R. P., Asstt. Professor of Chemistry, Govt. Science College, Gwalior.

Equilibria studies in aqueous and partly aqueous solvents will be made under varying conditions. Distribution studies will be performed in presence of complexing agent sodium nitrite. Separation studies will be tried with new eluant sodium nitrite. Kinetics of the ion exchange against H form of resin in partly aqueous systems will also be studied.

Jour. Ind. Chem. Soc. 42 ; 1965 : p. 53-54.

541.3723

775.70 Yadav, Ram Chandra. Conductive measurements in non-aqueous and mixed solvent media. Banaras, Chemistry, 1965-67. Ramanamurti, M. V., Reader.

Accurate conductance measurements of electrolytes in aqueous and mixed solvent media are being done on a conventional Wein's design bridge with Wagner earth device. Fuoss — On sagar equation has been used to calculate the limiting equivalent conductance, association constant and the ion-size parameter. Ionic structure and electrolyte-solvent behaviour can also be investigated if the molecular size of the ions is known.

541.372

Magnetochemistry

776.71 Zaveri, Sabbir Abuli. Magnetic study of the complexes of some transition metals. Bombay, Institute of Science, 1964-68. Datar, M. G., Professor.

The complexes of copper, cobalt and nickel halides with pyridine and substituted pyridines are being prepared and their magnetic susceptibilities measured at low temperatures. Their absorption spectra are also being studied. An estimate of metal-metal contraction will be made and the structure of these complexes established.

541.378

Radiochemistry

777.72 Bajpai, Ram Prakash. Determination of nitrogen in meteorites by activation analysis. I. I. T., Kanpur, Chemistry. 1966-69. Goel, P. S., Asstt. Professor.

It is planned to measure nitrogen in both stone and iron meteorites by activation analysis employing n. p. reaction. Samples will be sent to Bombay for neutron irradiations. The contents of nitrogen in meteorites will help provide information about the pressures prevalent at the time of the formation of meteorites.

541.389

778.73 Buragohian, P. C. High sensitivity counting Ni-59. I.I.T., Kanpur, Chemistry, 1966-69. Goel, P. S., Asstt. Professor.

At present, the nuclide Ni-59, which is an X-ray emitter, is essayed in the form of solid sample. For samples, this is a poor method because of serious self-absorption. The study of this nuclide in meteorites is of great interest for elucidating the cosmic-ray-exposure history of meteorites. Experiments are being planned to develop a suitable gas-phase counting technique for this nuclide.

541.389625

779.74 Desai, Kishorchandra Kalyanji. Studies on isotopic exchange reactions in non-aqueous solvents. Bombay, Institute of Science, 1964-67. Haldar, B. C., Professor of Inorganic Chemistry.

Isotopic exchange reactions in non-aqueous solvents, acetyl chloride and acetyl bromide have been studied using radioactive tracers to understand the mechanism of solute-solvent interaction. Halogen exchange between acetyl halide and tetra-substituted ammonium halide in nitrobenzene has also been investigated.

541.38

780.75 Garg, Amar Nath. Mossbauer studies of chemical bonds. I.I.T., Kanpur, Chemistry, 1966-69. Goel, P. S., Asstt. Professor.

It is planned to investigate the Mossbauer Effect in various compounds of iron and tin to elucidate the nature of chemical bonding and oxidation states of these cations or complex anions.

541.38

781.76 Ghosh, Amitabha. Investigations on radiocarbon dating. Calcutta, Chemistry, 1962-67. Datta, Jyotirmay, Reader, Bose Institute, Calcutta.

541.389681

782.77 Khorana, Shamsher. Physical and chemical changes brought about by radiations and recoil effects in solids. Bombay, Atomic Energy Establishment, Trombay, 1962-66. Jagdish Shankar, Head, Chemistry Division, Atomic Energy Establishment, Trombay.

Considerable isotopic exchange in the solid state has been observed in a number of radio cobalt doped cobalt chelates. Hence, it has been postulated that thermal annealing of recoil damage in neutron irradiated cobalt chelates occurs as a result of isotopic exchange in the solid state between the parent compound and the recoil species. This postulate has been shown to be essentially correct from experimental data on annealing and isotopic exchange.

541.388

783.78 Madhavan Kutty Nair, S. Physical chemistry. Banaras, Chemistry, 1965-66. Mohanty, S. R., Reader.

Studies are underway on the role of lattice defects, ultrasound and light in the thermal recovery of chemical radiation damage. The recovery of damage, both physical and chemical, in linear tempering and isochronal annealing is also being investigated.

541.38

784.79 Mani, R. S. Physico-chemical investigations on the preparation of isotopes and their compounds. Bombay, Atomic Energy Establishment, Trombay, 1964-67. Ganguly, A. K., Head, Health Physics Division, Atomic Energy Establishment, Trombay.

Methods for the preparation and purification of several important high specific activity radioisotopes and isotopically labelled compounds have been developed for use in industry, agriculture, medicine and scientific research.

541.388

785.80 Nair, N. R. Fission of heavy elements induced by neutrons. Bombay, Atomic Energy Establishment, Trombay, 1963-67. Ramaniah, M. V., Head, Radiochemistry Division, Atomic Energy Establishment, Trombay.

Mass distribution in the neutron fission of Pa^{231} has been investigated using radiochemical techniques. Relative yields of about twenty nuclides formed in this fission have been determined and plotted as the mass yield curve which has the familiar two humped shape with peaks around mass nos. 138 and 90. These data are being compared with similar data in literature.

541.38

786.81 Namboodiri, M. N. N. Radiochemical study of the fission of heavy elements by neutrons. Bombay, Atomic Energy Establishment, Trombay, 1962-67. Ramaniah, M. V., Head, Radiochemistry Division, Atomic Energy Establishment, Trombay.

The neutron induced fission of neptunium-237 is being investigated, using radiochemical techniques. Relative yields of about twenty fission product nuclides have been determined. The results indicate that the mass distribution is predominantly asymmetric, with peaks around mass nos. 97 and 138. The ranges of fission fragments in aluminium are also being measured.

541.389432

787.82 Trivedi, B. M. P. Production rate of H^3 and Na^{22} in glass exposed to 3-BeV protons. I. I. T., Kanpur, Chemistry, 1965-68. Goel, P. S., Asstt. Professor.

H^3 and Na^{22} are being measured in a thick stack of glass plates exposed to 3-BeV protons at Brookhaven. The experiment is planned to provide data for calculating production of these nuclides in stone meteorites by cosmic rays. H^3 is being counted in gas phase in the Gager region while Na^{22} has been counted by gamma-gamma coincidence technique.

541.389

788.83 Anwaruddin, Qadir Badshah. Kinetics of reactions in solution by photochemical methods. Madras, Physical Chemistry, 1964-67. Santappa, M., Professor.

Kinetics of photosensitized polymerization of vinyl monomers, like methyl acrylate, methyl methacrylate etc., have been studied using sodium anthraquinone-β-sulphonate in combination with sodium chloride or in buffer medium as photosensitizer. The effective wavelengths used are $365_{m\mu}$, $405_{m\mu}$ and $435_{m\mu}$. The monomer disappearance has been followed gravimetrically and the change in sensitizer concentration spectrophotometrically.

541.39

789.84 Bakshi, Shrikant Hari. Catalysis by ion-exchange resins. Bombay, National Chemical Laboratory, Poona, 1965-67. Krishnaswamy, N., Asstt. Director, Central Salt & Marine Chemicals Research Institute, Bhavnagar.

Synthetic ion-exchange resins are used as catalysts in various reactions as they offer various advantages over conventional catalysts. In the studies undertaken, various ion-exchange resins indigenously prepared are being compared with some foreign resins and the performance correlated to the physico-chemical properties of the resin.

541.395

790.85 Balram Singh. Thermodynamics and kinetics of some solid gas interactions. I. I. T., Delhi, Chemistry, 1966-69. Ramakrishna, V., Professor and Head of the Department.

The work is mainly confined to the study of the kinetics of decomposition of the halides of the IVB and VB group elements.

541.39

791.86 Bose, Mukul Kumar. Salt-effects on ionic equilibria and rates of ionic reactions. Jadavpur, Physical Chemistry, 1964-67. Das, M. N., Head of the Department.

Salt effects on the equilibra $CaSo_4$ (S) $+ 2IO_3^- \overset{K}{\rightleftharpoons}$ $Ca(IO_3)_2$ (S) $+ SO_4^{2-}$ and $CaSO_4$ (S) $+ 2Ag + \overset{K_2}{\rightleftharpoons}$ Ag_2SO_4 (S) $+ Ca^{2+}$ have been studied by solubility measurements. The kinetics of the acid catalysed, fading of malachite gereen and the effects of salts on it are being studied. The mechanism of the reaction *between persulphate and ferrocyanide will be established and the effects of pH and salts studied.*

541.39

792.87 Chopra, Bhumitra. Catalytic oxidation reactions. I. I. T., Delhi, Chemistry, 1966-69. Sandle, N. K., Lecturer.

Preparation of the various catalyst samples is in progress. Their physical properties are being investigated. Efforts are being made to set up magnetic susceptibility balance to explore the relationship between catalytic behaviour and magnetic susceptibility of the various catalysts thus prepared.

541.395

793.88 Dasgupta, Taraprasad. Kinetics and mechanisms of substitution in co-ordination complexes. Calcutta, Chemistry, 1963-67. Banerjee, D., Reader, Indian Association for Cultivation of Science, Calcutta.

541.39

794.89 Kabiruddin. Kinetic studies on the decomposition of cyanide complexes. Aligarh, Chemistry, 1965-68. Beg, M. Aijaz, Lecturer.

541.39

795.90 Kamal Jeet Singh. Kinetics and mechanism of enolisation of some keto-enolic systems. Jiwaji, Chemistry, 1965-67. Mhala, M. M., Professor.

Mechanism of the enolisation in higher acid media is proposed. The effects of substitution, solvent changes and salt effects will be studied in detail. Hammett's acidity function will be used to decide molecularity.

541.39

796.91 Kothandaraman, Harimurthi. Reaction of metal ions in solution. Madras, Physical Chemistry, 1966-69. Santappa, M., Professor.

It is proposed to investigate the equilibrium between outer orbital and inner orbital complexes involving heavy metal ions, such as, cobaltic, in solution by means of kinetic method.

541.392

797.92 Lakshmanan, S. Kinetics of electrode processes. Madras, Central Electrochemical Research Institute, Karaikudi, 1965-67. Devanathan, M. A. V., Scientist, Central Electrochemical Research Institute, Karaikudi.

The kinetics and mechanism of passivation of cadmium in alkaline solutions have been studied by the galvanostatic technique. Fixed area mercury electrode—a new sensitive tool for electroanalysis—has been developed and is being investigated by D. C. and A. C. polarography.

541.39

798.93 Natarajan, Vaidyanath Lalgudi. Metal ions in solutions. Madras, Physical Chemistry, 1965-68. Santappa, M., Professor.

Photochemical vinyl polymerisation initiated by the azido pentammine cobaltic chloride is being studied at different wavelengths. Monomers, like methylmethacrylate, methylacrylate, acrylo nitrile, acrylamide and methacrylamide have been polymerised photochemically by the azido complex. Detailed kinetic study is being done to get an insight into the mechanism of the polymerisation.

541.39

799.94 Rangaiah, Vaduguri. Studies on the influence of structure and solvent on the rate of reactions in solutions by spectrophotometric, polarographic and other physicochemical methods. Venkateswara, Chemistry, 1964-67. Brahmaji Rao, Sukur, Lecturer.

The kinetics of acid hydrolysis of phenyl and naphthyl esters in aqueous and non-aqueous solvents are under study. These experiments are being conducted to discover the solvent and structural effects on reaction rates and to verify Bunnett's criterion of proposing the mechanism of the reactions.

541.394

800.95 Rangaswamy, Madapusi. Kinetics involving metal ions. Madras, Physical Chemistry, 1964-67. Santappa, M., Professor.

Oxidation of mercurius ion by Ce^{4+} in aqueous HNO_3 medium and alcohols, aldehydes and ketones by Ce^{4+} in aqueous HCL_4 medium has been studied in detail. It has been observed that the oxidation of alcohols except benzyl alcohol occurs via the intermediate complex formation between Ce^{4+} and alcohol, the rate determining step being the slow unimolecular decomposition of the complex. Aldehydes and ketones are oxidised without any such complex formation but involving a simple bimolecular reaction. In the oxidation of Hg_2^{+2} by Ce^{4+} in HNO_3, the rate step is probably the fission of $(Hg\text{-}Hg)^{+2}$ bond and the reaction is observed to be faster probably because of the less covalent character of $Hg_2(NO_3)_2$ than either $Hg_2(ClO_4)_2$ or sulphate.

(1) Oxidation of n-Butanol by aq. ceric ions. Curr. Sci. 34(9) ; 1965 : p. 282-283 ; and (2) Kinetics of

oxidation of benzyl alcohol by aq. ceric ions. ibid. 35(13) ; 1966 : p. 332-333.

541.39

801.96 Saccubai, Sriramulu. Kinetics of polymerization. Madras, Physical Chemistry, 1964-67. Santappa, M., Professor.

The kinetics of vinyl polymerization using vanadium^{5+} along with an organic substrate, like alcohol, acid, ketone etc., as initiator, are being studied. The nature of initiation and termination reactions have been deduced from the experimental results and a suitable reaction mechanism has been proposed.

541.39

802.97 Subramanian, V. Kinetics of bromine addition to unsaturated sulphones. Madras, Pachaiyappa's College, Madras, 1962-66. Shanmuganathan, Sp., Professor and Head of the Department of Chemistry, Pachaiyappa's College, Madras.

The kinetics of bromine addition to several α, β- and β,γ-unsaturated sulphones in acetic acid have been studied. In the absence of any added electrolytes, the addition seems to follow the electrophilic mechanism, while in their presence it depends on the nature of the substrate, added salt and the concentration of the added electrolyte.

541.39

803.98 Venkata Ramana, Pillari. Studies on heterogeneous equilibrium. Venkateswara, Chemistry, 1966-69. Rama Krishnan, Vattarmadom, Reader.

The heterogeneous equilibrium is being studied with the help of radioisotope techniques. Surface area is one of the properties being studied in order to investigate the phenomenon of adsorption. Surface area of caesium perchlorate has been determined by surface exchange method.

541.392

804.99 Venkatarao, Krishna Rao. Kinetics of reactions in solution involving some metal ions with special reference to photo-oxidation and photo-polymerization reactions involving uranyl ions. Madras, Physical Chemistry, 1962-67. Santappa, M., Professor.

Reactions of uranyl ions with special emphasis on photo-oxidation and photo-polymerization reactions have been carried out. Photo-oxidation of aliphatic alcohols and aldehydes, and photo-polymerization of water soluble monomers, like acrylamide and methacrylamide, have been studied. Further studies on the solution properties of the polymers prepared are in progress.

Photo-oxidation of aqueous formaldehyde by uranyl ions. Curr. Sci. 33;1964: p.709-710.

541.39

Analytical Chemistry

General Analysis

Reagents

805.100 Chaudhuri, Nirmal Kusum. Organic reagents in inorganic analysis. Burdwan, Chemistry, 1966-68. Siddhanta, Sushil Kumar, Head of the Department and Das, Jyotirmoy, Lecturer.

Work on the use of some new organic reagents coordinating through oxygen in the determination of less familiar elements etc., using gravimetric, solvent extraction and spectrophotometric technique, is in progress.

543.01

806.101 Manku, Gurcharan Singh. Analytical inorganic chemistry. Delhi, Chemistry, 1966-69. Jain, B. D., Professor and Bhat, A. N., Lecturer.

543.01

807.102 Raja Reddy, Gadi. 'Oximes' as inorganic analytical reagents. Venkateswara, Chemistry, 1963-67. Neelakantam, Kalla, Professor and Head of the Department.

Resacetophenone oxime, 2-hydroxy-1-naphthaldoxime, peonol oxime, dimedone oxime and galacetophenone oxime have been prepared and their reactions with various metal solutions are being studied. Iron has been estimated spectrophotometrically by resacetophenone oxime. Palladium is being estimated by both peonol oxime and resacetophenone oxime. Some more metals will also be investigated.

(1) Proc. IAS. 59 ; 1964 ; and (2) Curr. Sci. 35(7); 5th Apr., '66 ; p. 172-173.

543.01

808.103 Sarkar, Ajit Kumar. Organic reagents in inorganic chemistry. Burdwan, Chemistry, 1965-67. Das, Jyotirmoy, Lecturer.

New organic reagents containing 1:3-diketo-groups are being used in the separation and determination of less familiar metals using gravimetric, spectrophotometric and solvent extraction methods. These methods have also been employed in the determination of these elements in common ores and alloys. Some chelating ion-exchange resins expected to be selective for these elements are being synthesised.

543.01

809.104 Syamasundar, Kamatam. Chalcones as inorganic analytical reagents. Venkateswara, Chemistry, 1962-66. Neelakantam, Kalla, Professor and Head of the Department.

Eight chalcones synthesised by condensing substituted benzaldehydes with polyphenolic acetophenines have been examined for reactions with various metallic and acidic ions. With a view to develop reagents for use in inorganic analytical chemistry 2',4'-dihydroxychalcone has been introduced as a colorimetric reagent for ferric iron. 2',3',4'-trihydroxychalcone has been investigated as an analytical reagent for germanium, uranium and copper using spectrophotometric, polarographic and amperometric methods.

(1) Proc. IAS. 59A ; 1964: p.241; (2) ibid. 60A; 1964: p.259 ; and (3) Curr. Sci. 34 ; 1965 : p.18.

543.01

810.105 Verma, Padam Singh. Periodic acid as an oxidant: Analytical applications and reaction mechanism. Jodhpur, Chemistry, 1966-67. Grover, Kalash Chandra, Lecturer.

Meta periodic acid has been used as an oxidant for the estimation of carbohydrates, carboxylic acid, amines, ketones and their reaction mechanism. Tortoric acid has been estimated at room temperature with a time limit for the production of formaldehyde and formic acid as reaction products, using phosphate as buffer. The reaction has been studied in the pH range 1-13 at temperature 20°-30°-40°C.

543.01

Analysis of Specific Products

811.106 Charanjit Singh. Search for new amoebicides. Jammu & Kashmir, Chemistry, 1966-69. Kachru, Chand Narayan, Reader.

A number of amoebicidal agents have been developed but emetine hydrochoride, though it suffers from high toxicity and emetic action, is the most efficatious as far as the activity is concerned. Some structural analogues are being prepared and will be tested against amoebiasis. These would help locating the seat of activity in the emetine molecule and subsequently establish the structural activity relationship in possible amoebicides.

543.5

812.107 Das, Prabhaschandra. On the synthesis of possible filaricides. Calcutta, Chemistry, 1964-67. Basu, U.P., Director, Bengal Immunity Research Institute, Calcutta.

543.5

813.108 Mathew, Attokaran George. Chemical studies of astringency in plant products with special reference to polyphenols. Kerala, Central Food Technological Research Institute, Mysore, 1963-66. Parpia, Husain Ali Bhimjee, Director, Central Food Technological Research Institute, Mysore.

The astringent taste of plant materials has been found to be due to the polyphenolic compounds, especially the flavonoids. The proposed work includes identification of polyphenols in typical fruits and condiments and their changes during maturation and processing to assess their contribution to quality.

543.1

814.109 Parabrahmam, M. Biodegradation studies of certain organic compounds likely to occur in wastewater. Nagpur, Central Public Health Engineering Research Institute, Nagpur, 1965-67. Mohanrao, G. J., Asstt. Director, Central Public Health Engineering Research Institute, Nagpur.

It is proposed to study the biodegradation of certain organic compouds present in industrial effluents like carbonization effluents. Some of the chemicals to be studied for biodegradation include monohydric, dihydric and polyhydric phenols. A mixed culture of bactetria will be developed which can decompose these organic compounds. The mechanism of decomposition of these ponds by acclimatisation of microorganisms will be studied. This work will have a bearing on evolving economic methods of treatment and disposal of industrial wastes.

543.32

815.110 Varghese, Thikkedathum. Studies on food chemistry and analysis. Calcutta, Chemistry, 1956-67. Ray, B. R.

543.1

Qualitative Analysis

Systematic Separations

816.111 Irshad Masood. Studies on the calcination of dolomitic limestones and their hydration. Roorkee, Chemistry, 1966-68. Malik, Wahid-uddin, Professor and Head of the Department and Dave, N.G., Scientist, Central Building Research Institute, Roorkee.

The kinetic parameters of calcination and decomposition of dolomitic limestone and the analytical methods for finding out the unhydrated magnesia in any dolime sample are being evaluated.

544.16

817.112 Mohd. Shakoor. Decomposition of hydrogen peroxide. Aligarh, Chemistry, 1966-69. Beg, M. A., Lecturer.

544.16

818.113 Paul, Agnes. Separation of inorganic cations by modern analytical methods. Madras, Analytical & Inorganic Chemistry, 1961-68. Janardhan, P. B., Professor.

Chromatographic separation of cations in different valency states has been carried out. Thus Cu^{+}, Cu^{2+}, Fe^{2+}, Fe^{3+}, Hg_2^{2+}, Hg^{2+}, Sb^{3+}, Sb^{5+}, Sn^{2+}, Sn^{4+}, Tl^{+} and Tl^{3+} have been separated making use of their differences in complex formation with the solvents. Polarography has been used for estimation after chromatography. The mechanism of paper chromatography has been thoroughly investigated.

Spectrophotometric estimation of copper (1) using rubeanic acid. Anal. Chem. 35 ; 1963 : p. 2119.

544.12

819.114 Qureshi, Saiduzzafar. Studies on ion exchangers for the separation and detection of compounds. Aligarh, Chemistry, 1966-69. n.g.

544.1

Spectrochemical Analysis

820.115 Chaudhari, Bhagwan, Studies on the sulphate containing evaporites from sea and inland brines. Bombay, Central Salt & Marine Chemicals Research Institute, Bhavnagar, 1963-66. Datar, D.S., Director, Central Salt & Marine Chemicals Research Institute, Bhavnagar.

Studies undertaken include determination of vapour pressure of bitterns, heavy water enrichment in bitterns and salt hydrates ; deposition of crystalline magnesium chloride and potassium bearing evaporites, determination of their constitution by DTG, DTA and X-ray diffraction ; and chemical reactions leading to the recovery of potassic fertilizers.

544.66

821.116 Ganguly, Leela. Spectrochemical studies of dipolar and co-ordination compounds. Bombay, National Chemical Laboratory, Poona, 1964-66. Biswas, A. B., Head, Physical Chemistry Division, National Chemical Laboratory, Poona.

Infrared spectra in the 4000-300 cm^{-1} region of isomeric amino benzene carboxylic and sulfonic acids, their potassium salts and some of their hydrochlorides have been analysed and probable assignments made for the different observed bands. The co-ordination complexes of orthanilic maleic and fumaric acids with the first row of transition metals have been prepared and their spectra analysed.

544.63

822.117 Nandi, Santidhan. Spectrophotometric studies on metal biguanide complexes. Jadavpur, Inorganic Chemistry, 1965-68. Sen, Debabrata, Professor of Inorganic Chemistry, I. I. T., Kharagpur.

Co-ordination complexes of different metals with biguanide and its derivatives have been prepared. The ultraviolet and visible spectra of these compounds have been recorded. Effect of the substitution on the ligand in the metal complex behaviour is being investigated.

544.6

Chromatographic Analysis

823.118 Akhtar, Sayeda Iqbal. The separation of metal ions by paper chromatography with special reference to iron. Aligarh, Chemistry, 1966-69. n.g.

544.925

824.119 Karmarkar, Kashinath Harihar. Electrodeless discharge as detector in gas-solid and gas-liquid chromatography. Poona, Chemistry, 1965-67. Arnikar, Harirao Jeevan, Professor and Head of the Department.

Electrodeless discharge has been successfully applied as detector in gas chromatography. Permanent gases like oxygen, argon and hydrogen, and organic vapours like hexane, cyclohexane, heptane, benzene etc., have been detected both singly and in mixtures, and a linear variation of the signal size with quantity injected has been observed. The influence of carrier gas flow rate, voltage applied for exciting the discharge and temperature of discharge tube have been investigated.

544.926

825.120 Khan, Fahmida. Effect of solvent composition on the paper chromatography of ionic and non-ionic substances. Aligarh, Chemistry, 1965-68. Qureshi, M. Mohsin, Reader.

544.925

826.121 Khan, Mukhtar Ahmad. Paper chromatography of metal ions with special reference to tin, antimony and mercury. Aligarh, Chemistry, 1965-68. n.g.

544.925

827.122 Krishna Rao, K. V. Paper chromatography, thin layer chromatography and paper cletrophorisis. Vikram, Chemistry, 1965-69. Bhagwat, M. V., Professor and Head of the Department.

544.92

828.123 Mohd. Usman. Absorption studies at interfaces. Aligarh, Chemistry, 1965-68. Beg, M. A., Lecturer and Devanathan, C., Asstt Professor, I. I. S., Bangalore.

544.922

829.124 Raghava Naidu, Rallapalle. The analytical chemistry of niobium and tantalum and of aluminium and beryllium. Venkateswara, Chemistry, 1963-68. Neelakantam, Kalla, Professor and Head of the Department.

Separation of niobium from tantalum and of aluminium from beryllium and their detection and estimation in the presence of others is being studied making use of organic reagents.

544.923

830.125 Rangnekar, Vithal Asha. Studies of transition metals : Liquid-liquid extraction and ion exchange. I. I. T., Bombay, Chemistry, 1964-67. Khopkar, S. M., Lecturer.

Liquid-liquid extraction techniques making use of 2-thenoyltrifluoroacetone have been developed for the extractive separation and spectrophotometric determination of metals, such as, Pd(II), Rh(III), Au(III), and Ir(VI), Ag(I) and Tl(I) on cation exchange resin and Pb(II) in malonate and chloride separations on anion exchange resin have been successfully separated from several metals by selective elution or complexation. The work on solvent extraction of Os(IV) and Ru and anion exchange studies of Zr(IV) and Ti(IV) is in progress.

(1) Mikro. Chim. Acta. 642 ; 1965 ; (2) Bull. Chem. Soc. Japan, 38 ; 1965 : p. 1696 ; and (3) Ind. Jour. Chem. 4 ; July '66.

544.923

831.126 Sen, Asit Kumar. Separation of some transition metals by ion-exchange and solvent extraction. Jadavpur, Inorganic Chemistry, 1963-66, De, A. K., Reader.

Solvent extraction behaviour of Ga(III), In(III), Tl(III), Co(II), Ni(II), Cu(II), Pd(II) and Nb(V) with TBP has been observed. Ores of bronze, limestone, dolomite and chrome-iron are being analysed by ion-exchange chromatography.

(1) Z. Anal. Chem. 211 ; 1965 : p. 243 ; (2) Talanta. 13(853) ; 1966 : p. 1313 ; and (3) Sep. Sci. 1 ; 1966 : p. 641.

544.923

832.127 Sharma, Krishna Datt. Studies in paper chromatography of inorganics with solvents containing chloroform. Jiwaji, Chemistry, 1965-67. Bhatnagar, R. P., Asstt. Professor of Chemistry, Govt. Science College, Gwalior.

Systematic paper chromatographic studies in solvents containing chloroform are being performed with (a) Ag, Hg, Tl, Pb ; (b) less familiar elements ; (c) Oxy-anions ; and (d) metal-dithizonates. Critical study of the effect of time on the rate of solvents flow is also being done.

(1) Anal. Chim. Acta. 30 ; 1964 : p. 310-312 ; and (2) Ind, Jour. Chem. 4 ; 1966 : p. 47.

544.92

Quantitative Analysis

Gravimetric Analysis

833.128 Goel, D. P. Analytical chemistry. Delhi, Chemistry, 1965-68. R. P. Singh, Reader.

Potentiometric and spectrophotometric studies have been made on some metal complexes with O-vanillin and its derivatives. Gravimetric determination of Pd^{2+}, nickel and copper etc., has been undertaken using the above reagents. Separations of $Pd^{2}+$ and $Ni^{2}+$; nickel and copper have also been carried out. Color-reactions with certain metals have been made the basis of spectrophotometric studies.

545.1

834.129 Trikha, Kuldip Chand. Analytical chemistry. Delhi, Chemistry, 1963-67. Seshadri, T. R., Professor Emeritus and R. P. Singh, Reader.

Gravimetric and spectrophotometric determination of palladium and cobalt using phenanthrenequinone-monoxime has been carried out. Stability constants of certain bivalent metal ions with PQM have also been evaluated. Diphenylthiovioluric acid has been used for the gravimetric determination of palladium and its separation from other metals of the platinum group.

545.1

Volumetric Analysis

835.130 Krishna Reddy, Yendapalli. Newer methods in titrimetry. Venkateswara, Chemistry, 1961-67. Appala Raju, Nadimpalli, Reader.

Resacetophenone and a few of its derivatives have been studied as possible titrimetric reagents in the analysis of metals, alloys and ores using volumetric, amperometric and conductometric techniques.

(1) Proc. IAS. 61A;1965 : p.368; (2) ibid. 62A; 1965 : p.231; and (3) Curr. Sci. 35;1965: p.64.

545.2

836.131 Shakunthala, R. Redox indicators in vanadametry. Mysore, Chemistry, 1964-68. Sanke Gowda, H., Professor and Head of the Department.

All redox indicators which have been introduced as inside indicators in vanadametry are unsatisfactory for one reason or another. Hence investigation in the field of indicators has been undertaken to develop suitable redox indicators in vanadametry. Three new redox indicators have been discovered. The applications of these indicators in vanadametry are being investigated.

Talanta. 13 : p.1375-1379.

545.2

837.132 Shrestha, J. L. Some methods of chemical analysis based on non-aqueous titration and differential kinetics. Jadavpur, Physical Chemistry, 1964-67. Das, M. N., Reader.

A method has been developed for estimation of potassium in the presence of sodium and lithium by titration in acetic acid-choloroform medium. Studies have been conducted on differential titration of mixtures of bases in non-aqueous media. Unsaturated compounds have been estimated by non-aqueous titration with the addition of mercuric acetate to the carbon-carbon double bond. Mixtures of primary and secondary amines have been estimated by differential kinetics.

545.2

838.133 Singhal, Gopal Krishan. Studies on metallochromic indicators. Rajasthan, Chemistry, 1965-68. Tandon, Kameshwar Nath, Lecturer.

Some new dyes shall be prepared and tested for their indicator action in complexometric titrations. Some known indicators may be used as metallochromic indicators for other metal ions. Some physico-chemical studies will be made to investigate mechanism of complex formation.

545.2

839.134 Venkata Reddy, Devarinti. Studies in reduction reaction in analytical chemistry. Venkateswara, Chemistry ,1963-68. Appala Raju, Nadimpalli, Reader.

Thiourea and its derivatives have been studied as possible volumetric reducing agents. Attempts have also been made to estimate qualitatively the compounds, such as, potassium dichromate, potassium permanganate, iodine and potassium ferricyanide.

545.23

Electroanalysis

840.135 Arjun Dass. Studies in some metal insoluble electrode systems. Roorkee, Chemistry, 1965-68. Malik, Wahid-uddin, Professor and Head of the Department.

The behaviour of metal ferrocyanogen compounds in ferro-ferricyanide solutions is being studied with the help of metal insoluble electrode systems and radioactive tracer techniques.

Metal ferrocyanogen electrodes. Part I. Ind. Jour. Chem. 4;1966 : p.203-205.

545.3

841.136 Bhutra, Ghanshyam Lal. Studies of some irreversible electrode processes. Jodhpur, Chemistry, 1964-67. Kapoor, Ramesh Chandra, Professor and Head of the Department.

Studies of electro-reduction of some organic disulphides, like dithiodimalic acid, dithiodiglycolic acid, dithiodisalycylic acid etc., have been undertaken and dropping mercury electrode has been used for this purpose. The processes have been found to be irreversible. Their kinetic parameters are being calculated.

545.32

842.137 Burangey, Shripad Vinayak. Voltammetry using mercury pool and molybdenum electrode system. Bombay, Atomic Energy Establishment, Trombay, 1965-67. Athavale, V. T., Head, Analytical Division, Atomic Energy Establishment, Trombay.

Mercury pool cathode and molybdenum reference electrode system have been developed for voltammetric work on the cathode ray polarograph. A semi-micro cell comprising both these electrodes with a capacity of 0.2 ml. has been fabricated and found useful in mixed solvent media.

545.32

843.138 Dasgupta, Premabrata. Polarography. Banaras, Chemistry, 1965-67. Deshmukh, G. S., Reader.

Estimation of various metallic ions, like copper, lead, uranium, vanadium, tungsten, arsenic etc., has been carried out in phosphoric acid medium polarographically. Separation of these ions has also been performed. Influence of pH, molarity of phosphoric acid on i_d have been studied. A method for estimation of gold in phosphoric acid buffer has been developed.

545.32

844.139 Dhaneshwar, Mangala Ramesh. Voltammetric studies using different (metal, metal oxide, amalgam and mercury) electrode systems. Poona, Atomic Energy Establishment, Trombay, 1965-67. Athavale, V. T., Head, Analytical Division, Atomic Energy Establishment, Trombay.

Bimetallic electrode systems, Ag-Mo and Ag/Hg-Mo have been used on cathode ray polarograph. These systems give only silver waves in presence of all other ions. Ag/Hg or Ag is an indicator electrode and Mo is a reference electrode. Existing equations have been modified for the peak current-concentration relationship.

545.32

845.140 Goswami, Nootan Kumar. Polarographic studies in aqueous and non-aqueous media. Rajasthan, Chemistry, 1964-67. Gaur, Jagdish Narain, Reader.

The polarography of Ni, Co, Mn, Cn, Eu, Yb, Sm etc., will be studied in the light of the following aspects: Effect on $E_{\frac{1}{2}}$, diffusion coefficient, reversibility etc.

545.32

846.141 Gupta, Prem Nath. Influence of the viscosities of a few typical suppressors and concentrations of supporting electrolytes on the diffusion current (Id) and half wave potential ($E_{\frac{1}{2}}$) Cd^{++}, Pb^{++}, Zn^{++}, Cu^{++} and others. Jammu & Kashmir, Chemistry, 1966-69. Bhattacharaya, Abnai Kumar, Head of the Department.

Electrochemical behaviour of gelatin and other suppressors is proposed to be studied. Some experiments of the special conductivity polarographic current and viscosity of the suppressor 'gelatin' have been carried out to determine the theory and practical aspect of the suppressors.

545.3

847.142 Hanumaji, Angara. Studies in electrometric titrations. Venkateswara, Chemistry, 1964-68. Brahmaji Rao, Sukur, Lecturer.

Amperometric, potentiometric and conductometric studies are being made of reactions of arsenic, antimony and tin with organic reagents in aqueous and aqueous-non-aqueous media.

545.31

848.143 Jain, Dunger Singh. Polarographic study of the complex formed by 1 : 2 diaminocyclohexane tetra acetic acid, benzoate, glycolate etc., with metalions. Rajasthan, Chemistry, 1962-67. Gaur, Jagdish Narain, Reader.

Polarography of lead, cadmium, zinc, manganese, cobalt, thallium, indium, currpium etc., has been studied in non-complexing and complexing media. The complexes of CDTA with Zn^{2+}, Mn^{2+}, Ne^{2+}, Co^{2+}, Pb^{2+}, Cd^{2+}, Tl^{+}, Ga^{3+}, In^{3+}, Cu^{2+}, Eu^{3+}, La^{3+}, Yb^{3+}, Br^{3+}, Nd^{3+} have been studied. The composition, stability constants and kinetic parameters have also been calculated. The stepwise complexes of Pb^{2+}, Cd^{2+} with formate glycolate, benzoate, salicylate and nitrite are being studied and their analytical uses mentioned.

545.32

849.144 Joshi, Mahadeo Prasad. Electrometric studies on isopolytungstate and molybdates of some rare metals. Rajasthan, Chemistry, 1966-68. Gupta, Chand Mal, Lecturer.

Purity of the reagents has been tested by standard method of analysis. Preliminary understanding about the various instrumental techniques has been obtained. Polarography of known system Cd, Pb etc., has been done. Amperometric analysis of the various isopolytungstates, isopolymolybdates and the metal ion (Sm^{3+}) has also been carried out.

545.32

850.145 Mathur, Krishna Chandra K. Studies on some oxidation-reduction electrode processes. Jodhpur, Chemistry, 1963-66. Kapoor, Ramesh Chandra, Professor and Head of the Department.

The behaviour of metal ions Ag^{+}, Cu^{++}, and Fe^{++} and Fe^{+++} has been studied using rotated platinum electrode. Complexes of these metal ions which behave reversibly and irreversibly at the electrode have been dealt with for the determination of their coordination numbers and stability constants.

Voltammetry with rotated platinum electrode. Jour. Pol. Soc. 11;1965 : p. 64.

545.32

851.146 Nageswar, S. Mechanism of electrodeposition and dissolution of metals. Bangalore, Chemistry, 1966-69. Setty, T. H. Venkata, Professor.

The (100), (110) and (111) faces of silver single crystals have been subjected to anodic dissolution and cathodic deposition under galvanostatic condition in highly purified silverperchlorate solution. The effect of surface active substances and anions on the nature and behaviour of electrodeposition and dissolution of silver is under detailed study.

545.34

852.147 Naik, Vijay Shridhar. Analytical chemistry. Banaras, Chemistry, 1965-67. Deshmukh, G. S., Reader.

Polarographic study of molybdenum in hydroxyl amine hydrochloride is being carried out. Methods have been developed to separate molybdenum from other transition metals.

545.32

853.148 Nawal Kishore. Polarographic studies on the kinetics and mechanism of electrode processes. B. I. T. S., Pilani, Chemistry, 1966-69. Gupta, Shyam Lal, Professor and Head of the Department.

545.32

854.149 Puran Chand. Physico-chemical studies on the micellar properties of the surfactants and their interaction with dyes. Roorkee, Chemistry, 1964-67. Malik, Wahid-uddin, Professor and Head of the Department.

The research deals with the following problems: (1) Use of non-ionic surfactants as a polarographic maxima suppressors; (2) Determination of c.m.c. of non-ionic surfactants by polarographic, spectrophotometric and electrocapillary data methods; (3) Interaction of dyes with surfactants by spectrophotometric and polarographic methods; and (4) Effect of urea formamide and methyl-alcohol on the aggregation of dyes by polarographic method.

(1) Jour. Anal. Chem. 37; Nov. '65 : p. 1592-1594; and (2) Jour. Amer. Oil Chem. 43 (7). 1966 : p. 446-448.

545.32

Radiochemical Methods

855.150 Augustine, Daniels Ebenezer. Tracer studies of surface reactions following adsorption. Poona, Chemistry, 1962-67. Arnikar, H. J., Professor and Head of the Department.

The kinetics of adsorption of iodine and bromine on aluminium and copper have been studied by calorimetric method and that of iodide ion on silver and glass by the tracer technique. The kinetics of desorption and surface self-diffusion of iodide ions and their adsorbed film on silver have also been studied.

545.824

856.151 Keri, Zarin. Rapid radiochemical separations in activation analysis. Bombay, Institute of Science, 1964-67. Haldar, B. C., Professor of Inorganic Chemistry.

Rapid radiochemical separation procedures involving solvent extraction and precipitation reactions have been developed for the determination of rhenium and molybdenum in copper ores. The separation procedures and the measurements of activities of rhenium and molybdenum are completed within 70 minutes after the receipt of the irradiated ore in the laboratory.

545.822

Inorganic Chemistry

Oxidation & Reduction

857.152 Khodaskar, Shridhar Narayanrao. Studies in chemical kinetics of some oxidation-reduction reactions. Marathwada, Chemistry, 1964-68. Khanolkar, D. D., Professor.

A study of the kinetics of the reaction between substituted thioureas and oxysalts of copper is being carried out with the help of different techniques, like spectrophotometry, potentiometry, magnetometry and conductometry. The measurements will be taken by varying different factors, such as, ionic strength, pH of solution, solvent, temperature and concentrations of reactants.

546.123

Metals

858.153 Bhardwaj, Hari Chand. Chemical studies of the antiquities from Rajghat and adjoining areas. Banaras, Chemistry, 1965-67. Deshmukh, G. S., Reader.

The study is intended to throw light on the ancient technology, as revealed by the chemical study of the chronologically ordered representative specimens of metals, like copper, bronze, lead, iron etc., and silicates, like glass beads, fience, pottery etc., from archaeological excavations at Rajghat—old Varanasi, from circa 400 B. C. onwards.

546.3

859.154 Garg, Bhagwan Singh. Determination of stability constant of metals. Delhi, Chemistry, 1966-69. R. P. Singh, Reader.

It deals with the determination of stability constants of uranyl, copper, beryllium, nickel, cobalt, zinc, iron, aluminium and thorium with 1-hydroxy-xanthone and its derivatives. Spectrophotometric study of Zr, Th, V, Mo complex with 5-hydroxy flavones and flavanils has also been undertaken.

546.3

860.155 Agarwal, Man Mohan. Lewis Acid behaviour of some metal chlorides and alkoxides. Rajasthan, Chemistry, 1963-67. Mehrotra, Ram Charan, Head of the Department.

A number of double alkoxides of Ti, Zr, Sn, Th, Nb, Ta and aluminium have been isolated. Their molecular weights and conductometric titrations have been carried out. These compounds are monomeric and are purified by volatilisation or crystallisation.

546.343

861.156 Anand, Sham Kumar. Alkoxides and chloride alkoxides of molybdenum, tungsten and vanadium. Delhi, Chemistry, 1966-69. Jain, B. D., Professor.

546.345

862.157 Balachandran, K. A study of stability, composition and formation constant of metal complexes. B.I.T.S., Pilani, Chemistry, 1966-69. Banerjee, S. K., Assoc. Professor.

A search is being made of the various new metal complexes and it is proposed to study the stability constant, composition, formation constant, effect of the presence of various metals, the specificity of ligands, stability relation to pH by various physico-chemical means particularly spectrophotometric, conductometric and potentiometric methods.

546.345

863.158 Bhatt, Indravadan Manubhai. Studies in complex formation. Gujarat, Chemistry, 1960-66. Trivedi, A. M., Reader.

546.345

864.159 Khan, Mohd. Mahfooz. Studies in metal complexes. Aligarh, Chemistry, 1965-68. Nasim Ahmad, Lecturer.

546.345

865.160 Mohd. Jamil Ahmad. Studies on the complexes of metal ions with alizarine. Aligarh, Chemistry, 1965-68. Fazlur Rahman, S. M., Reader.

546.345

866.161 Paigankar, Anil Vasantrao. Studies on some metal complexes of substituted amidino-thiourea. Bombay, Institute of Science, 1964-67. Haldar, B. C., Professor of Inorganic Chemistry.

A study of the reactions of N-amidino-S-ethyl thiourea (HASETU) with transition metal ions has been carried out. Three new compounds, $Co(ASETU)_2$, $Ni(ASETU)_2$ and $Cu(ASETU)_2$ have been isolated and their structures investigated by infrared, visible absorption, reflectance and magnetic measurements at different temperatures in the range 85°-300°K.

546.345

867.162 Ramamoorthy, S. Metal complexes. Madras, Physical Chemistry, 1964-67. Santappa, M., Professor.

pH titration and spectrophotometric methods have been employed for evaluating the composition and stability constants of the complexes of uranyl ion and copper with carboxylic acids as ligands. The degree of formation, $\bar{\eta}$ of the system and free ligand concentrations have been calculated by Bjerum's method. Titrations have been carried out at various concentration ranges of metal, ligand and acid to prove the presence or absence of polynuclear, mixed and hydroxy complexes. Thermodynamic quantities $\Delta H - \Delta S$ have also been calculated

546.345

868.163 S. S. Singh. Studies on molecular complexes. Agra, Chemistry, 1966-69. Kartar Singh, Director, Defence Science Laboratory, New Delhi.

Certain electron donor chemical compounds called Lewis base can undergo complexation with other electron acceptor compounds called Lewis acid as a result of charge-transfer between them. The present work aims at preparing new C-T complexes and studying their physico-chemical characteristics with a view to characterize them.

546.345

Alkaline Earth Metals

869.164 Baral, Apurbakrishan. Polymer complexes of beryllium. Calcutta, Chemistry, 1965-67. Ray, N. N., Reader.

546.39125

870.165 Panthina, Charana Das. The chemistry of beryllium complexes. Bombay, Atomic Energy Establishment, Trombay, 1960-68. Rao, G.S., Scientific Officer, Atomic Energy Establishment, Trombay.

The chemistry of beryllium complexes is being studied systematically. It is intended to compare the complexing properties of beryllium with simple and polydentate ligands with those of other divalent metal ions. It is also intended to obtain the thermodynamic data from the stability constants of these complexes and compare this with similar data of other divalent ions.

546.39125

Rare Earth Elements

871.166 Ramanathan, Venkita Subban. Studies on anhydrous rare earth compounds. Kerala, Chemistry, 1964-68. Moosath, Subramaniam, Subramanian, Reader.

The development of preparative methods of anhydrous compounds of individual rare earths are being studied with special reference to their recovery from monazite sand.

546.4

Lanthanide Series

872.167 Bhattacharyya, Mintoo. Chemistry of lanthanum. Calcutta, Chemistry, 1963-67. Datta, Niharkumar, Professor, Indian Association for Cultivation of Science, Calcutta.

546.411

873.168 Chotra, Joginder Singh. The Chemistry of some lanthanide carboxylates. Panjab, Chemistry, 1964-67. Paul, Ram Chand, Professor and Head of the Department.

Carboxylates i.e. propionate, n-butyrate, iso-butyrate, iso-valerate, caproate, mono and dichloro acetate have been prepared by employing an acid interchange method and their thermogravimetric analysis and magnetic properties have been studied. Lanthanides and acetates have been used to prepare anhydrous halides of lanthanides.

546.41

874.169 Nag, Kamalaksha. The chemistry of lanthanum. Calcutta, Chemistry, 1964-67. Datta, N. K., Professor, Indian Association for Cultivation of Science, Calcutta.

546.4112

875.170 Rastogi, Prem Lata. Inorganic chemistry. Banaras, Chemistry, 1966-68. S. Prasad, Reader.

The co-ordination compounds of neodymium have been analysed and anhydrous neodymium chloride prepared. A number of complex compounds of $NdCl_3$ with organic ligands have been prepared in non-aqueous media and their properties studied. Further work is in progress.

546.4132

876.171 Srivastava, Shri Kant. Inorganic chemistry. Banaras, Chemistry, 1966-68. S. Prasad, Reader.

Studies on the complex compounds of lanthanum have been undertaken to prepare the complex compounds of La(III) with organic ligands and study their properties by physico-chemical methods.

546.41125

Actinide Series

877.172 Bhandari, Akshya Mall. Organic compounds of uranium. Jodhpur, Chemistry, 1963-66. Kapoor, R. N., Reader.

Organic derivatives of pentavalent uranium have been investigated by studying the reactions of uranium pentaethoxide with various ligands, like β-ketoesters, β-diketones, acetyl chloride and bromide, glycols etc., in different molar ratios in absolutely anhydrous conditions to eliminate the effects of hydrolysis. Reactions of uranium tetrachloride are also being investigated with fattyacids.

(1) Can. Jour. Chem. 44 ; 1966 : P. 1468 ; (2) Z. Anorg. Allgem. Chem. 346; 1966 : p.332.

546.431

878.173 Kundu, Phatikchandra. Reaction cupteron with hexavalent uranium and its applications. Calcutta, Chemistry, 1961-67. Shome, S. C., Professor, Presidency College, Calcutta.

546.432

879.174 Satyanarayana Murti, Neelapala Veera Venkata. Some aspects of the chemistry of the actixide elements. Banaras, Chemistry, 1965-67. Mohanty, S. R., Reader.

The complexes of sulphoxides with the actinide and fission product elements are being investigated. A number of complexes of thorium, uranium and zirconium with various sulphoxides have been prepared and are being examined by X-ray diffraction, magnetic susceptibility, infrared and ultraviolet visible spectroscopy etc.

546.421

880.175 Vaidyanathan, Somasundaram. Some aqueous redox reactions of plutonium including those induced by ultrasonics. Bombay, Atomic Energy Establishment, Trombay, 1964-68. Ghosh Mujumdar, A. S.

The kinetics of the reduction of plutonium (IV) by hydrogen peroxide in perchloric acid solutions are being investigated. Plutonium (IV) forms brown and red peroxy complexes with hydrogen peroxide, and a study of the decomposition of these complexes is in progress.

Proceedings of the Nuclear and Radiation Chemistry Symposium held at Waltair in 1966. p. 84-91.

546.434

Titanium & Vanadium Groups

881.176 Chawla, Krishan Lal. Vanadium compounds in reductimetric titrations. Rajasthan, Chemistry, 1964-67. Tandon, Jagdish Prashad, Reader.

Vanadium in bi, tri and quadri valancy states has been made the basis of a number of reductimetric titrations marking one, two or three electron changes.

(1) Talanta. 12 ; 1965 : p.665 ; and (2) ibid. 13 ;1966 : p.859.

546.5222

882.177 Geetha, Sankarasubbaw. Studies in the chemistry of zirconium and hafnium. Kerala, Chemistry, 1965-67. Joseph, P. T., Reader.

The reactions of Zr and Hf salts with monochloro and trichloro acetic acids have been studied. The use of Zr and Hf salts as Friedel-Crafts catalysts has been investigated. Organometallic compounds involving Zr and Hf are being studied. The chelates of Zr and Hf will also be investigated.

546 51

883.178 Hot Chand. Studies on hydrous zirconium (IV) oxide. Rajasthan, Chemistry, 1965-68. Kulshrestha, Narendra Kumar, Lecturer.

A physico-chemical study of the behaviour of zirconium (IV) salt solution has been completed in both aqueous and non-aqueous media. Studies of the kinetics of adsorption of molecular colloids on the hydrous oxide samples, and of the stability and kinetics of coagulation of Zr (IV) hydrous oxide solution are in progress.

546.51324

884.179 Kapadia, P.K. Polarographic study of some zirconium complexes. Bombay, Institute of Science, 1963-67. Joshi, K. M., Asstt. Professor.

The polarography of zirconium and its compounds is being investigated. Effect of chelating agents in the polarograms is also being studied.

546.51325

Iron & Ruthenium Series

885.180 Gupta, Gopal Dass. Physico-chemical studies of transition metal ions. I.I.T., Delhi, Chemistry, 1965-68. Jere, G. V., Asstt. Professor.

Peroxy compounds of Th and Zr have been prepared and subjected to physico-chemical studies, like X-rays, DTA, TGA, magnetic and spectroscopic properties. These studies have revealed the molecular structure of the compounds. Some new compounds have also been prepared with zirconium.

546.62

886.181 Iasemansa, Kshatriya Murlidhar. Chlorination of transition metal compounds. I.I.T., Delhi, Chemistry, 1966-69. Jha, N. K., Lecturer.

It is proposed to prepare the binary and complex compounds of transition metals containing halogens and to study their physical and chemical properties.

546.62

887.182 Khadikar, Padmakar Vinayak. Physico-chemical studies on cobalt (II) complexes. Vikram, Chemistry, 1966-70. Bhagwat, W. V., Professor and Head of the Department.

546.62325

888.183 Mathur, Rajendra Prashad. Transitional metal complexes with poly aminocarboxylic acids. Jodhpur, Chemistry, 1964-67. Kapoor, Ramesh Chandra, Professor and Head of the Department.

Certain transitional metal complexes of iron, cobalt, nickel and copper have been studied both spectrophotometrically and polarographically. The results have been used for calculations of instability constants of the complexes formed and to investigate best conditions for their formation.

546.6225

889.184 Sharma, Prem Prakash. Alkoxides and allide derivatives of iron (III). Rajasthan, Chemistry, 1963-66. Mehrotra, Ram Charan, Head of the Department.

The reactions of the following reagents on ferric alkoxides have been studied : Organic esters, methanol, ethanol, phenol, trimethylacetoxysilane, acetyl halides, hydrogen chloride, β-diketones, β-ketoesters, methylsalicylate, salicylaldehyde, glycols, catechol, ethanolamines, α=hydroxy acids, higher carboxylic acid, acetic acid, benzoic acid and acetic anhydride.

546.62124

890.185 Talwar, Urmila Bhagwandas. Separation of metals by liquid-liquid extraction. Bombay, Institute of Science, 1964-67. Haldar, B. C., Professor of Inorganic Chemistry.

Isonitrosoacetylacetone and isonitrosoacetophenone have been employed to separate palladium from other ions by extraction with organic solvents. With isonitrosoacetylacetone, 96% of Pd can be extracted from aqueous solution of pH 4 — 6 by a single extraction with CCl_4. From solutions of acetic acid and mineral acids, except HCl, palladium can be quantitatively extracted with isonitrosoacetophenone in benzene.

546.636

Copper & Boron Groups

891.186 Maitra, Amar Nath. Studies on boron and silicon heterocycles. Jadavpur, Inorganic Chemistry, 1965-68. Sen, Debabrata, Professor of Inorganic Chemistry, I. I. T., Kharagpur.

Some boron and silicon heterocycles with biguanides, substituted biguanides, and guanylureas have been synthesised and characterised as $B(O\text{-}Alkyl)_2L$, where L is the ligand concerned, by elemental analysis and physical studies, such as, molecular weight determination, ultraviolet spectra etc.

546.6712

892.187 Misra, Gopal Ji. Studies in copper (I) compounds and their applications in volumetric analysis. Rajasthan, Chemistry, 1963-67. Tandon, Jagdish Prasad, Reader.

The applications of the reducing properties of Cu(I) compounds in a number of titrimetric procedures using visual as well as potentiometric indication methods have been studided. Copper (I) compounds have been utilized for the determination of binary as well as ternary mixtures of oxidising agents and organic compounds. Selenium and gold have also been determined. Reactions of copper (I) compounds with a number of reagents are being studied to find out some suitable form which may be handled more conveniently without the danger of aerial oxidation.

(I) Standardisation of copper (I) compounds. Z. Anal. Chem. 214; 1965 : p.94; and (2) Use of copper (1) in the determination of peroxy salts and peroxides. Chemist-Analyst. 55;1966 : p. 79.

546.6522

Carbon Group

893.188 Datta, Debranjan. Interaction of covalent metal halides and other metal derivatives with organometallic compounds of tin and silicon. North Bengal, Chemistry, 1966-68. Ghosh, A. K., Reader.

The reactions between covalent metal halides, organometallic halides or other metal derivatives and organometallic compounds of tin and silicon have been studied to isolate Sn-O-M and Si-O-M bonded compounds, where M is metal.

546.68

894.189 Dhar, Rabindranath. Physico-chemical properties of a few silicates. Calcutta, Chemistry, 1964-68. Das, S. R.

546.6832

895.190 Mathur, Sudha. Organic derivatives of germanium. Rajasthan, Chemistry, 1964-67. Mehrotra, Ram Charan, Head of the Department.

Alkoxy alkyl (aryl) germanes have been prepared by ammonia, oxide alcoholysis and transesterification methods and their reactions studied with glycols, carboxylic acids, ethanolamines, acetylhalides and hydrogen sulphide. Hydrolysis of alkoxy alkyl (aryl) germanes has also been studied.

(1) Organic derivatives of germanium: Part synthesis and reactions of alkyldialkoxygermanes. Jour. Organometal. Chem. 4 ; 1965 : p. 294 ; (2) Reactions of dialkoxydibutylgermanes with alcohols and glycols. ibid. 4 ; 1965 : p. 371; (3) Synthesis of alkoxygermanes from organogermanium oxides. ibid. 6 ; 1966 : p. 11 ; (4) Glycol derivatives of tributyl and diphenyl alkoxygermanes. ibid. 6 ;1966 ; and (5) Application of ammonia method in the synthesis of diphenyl and tributylalkoxygermanes. Jour. Ind. Chem. Soc. 43 ; 1966 : p. 489.

546.6842

896.191 Sharma, Satish Kumar. Studies in the formation and properties of carbon-oxygen-surface complexes. Panjab, Chemistry, 1963-67. Puri, B. R., Professor.

The formation of surface oxygen complexes on various charcoals and carbon blacks on treatment of the carbons with different oxidising gases and solutions has been studied. The nature of the complexes formed, their stability, and their influence on surface characteristics, such as, acidity, preferential adsorption, vapour adsorption, heat of immersion etc., will also be studied.

546.6812

897.192 Sharma, S. K. O^{18} and C^{13} studies of natural carbonates. I.I.T., Kanpur, Chemistry, 1965-68. Sharma, T., Asstt. Professor.

The isotopic studies now underway will give information regarding the formation of carbonates.

546.6812

Nitrogen Group

898.193 Gupta, Mohinder Paul. Studies in the chemistry of metal complexes of ditertiary phosphines. Panjab, Chemistry, 1963-67. Sandhu, Sarjit Singh, Reader.

Addition complexes of 1,2-bis (diphenylphosphine) ethane and 1,4-bis (diphenylphosphine) butane with halides (chlorides, bromides and iodides) of certain metals of group II, through group IV have been prepared. A study of stoichiometry, structure and stereochemistry of these complexes, the effect of ring size on their stability, the relative strength of the Lewis Acids and the ligand-metal bond strength has been undertaken.

546.71225

899.194 Jain, Jinmat Pershad. Physico-chemical studies on metal cyanocomplexes and their interaction with heavy metal ions. Roorkee, Chemistry, 1964-67. Malik, Wahid-uddin, Professor and Head of the Department.

Tungsto-tungsticyanide, molybdo-molybdic cyanide and their cyanide substituted complexes have been prepared. Potentiometric estimation of tungstocyanide complexes has been done using different oxidants and it is proposed to determine the E° value of these compounds and the effect H^+ IONCOM and E° value. The interaction of tungstocyanide and molybdocyanide and tungstimolybdi-cyanide complexes with rare metal ion is being carried out and their isolation and physico-chemical studies will be undertaken.

546·71125

900.195 Krishna Iyer, Ramaswamy. Studies with complexes of arsenic, antimony and bismuth. Kerala, Atomic Energy Establishment, Trombay, 1964-67. Jagdish Shankar, Head, Chemistry Division, Atomic Energy Establishment, Trombay.

The complexes of antimony and bismuth with ethylenediamine tetra-acetic acid, hydroxyethylethylenediamine triacetic acid, 1,2 diaminocyclohexane tetra-acetic acid, nitrilo-triacetic acid, ethylene glycol bis (2 aminoethyl) ether tetra-acetic acid, and diethylenetriamine penta-acetic acid are being studied by spectrophotometric and potentiometric methods to calculate their stability constants. Work has also been planned on complexes of Sb and Bi with pyrocatechol, tiron and pyrocatechol violet.

(1) Z. Anorg. Allgem. Chem. 335 ; 1965; p.331-336 ; and (2) Talanta. 13 ; 1966 : p. 631-634.

546.71525

901.196 Oza, Chandra Kishore. Studies in condensed phosphates. Rajasthan, Chemistry, 1964-68. Mehrotra, Ram Charan, Professor and Head of the Department.

Complex polymetaphosphate derivatives of lithium have been prepared with certain bivalent metals. The conductance measurements have been carried out and the molecular weights determined by end group titration and viscosity measurement methods. Light scattering infrared and other measurements will also be carried out.

Ind. Jour. Chem. 4 (8) ; 1966 : p. 356-359.

546.7122

Oxygen Group

902.197 Jose, Jacob Thekkumpuram. Oxidative and hydrolytic studies of elemental sulphur and sulphur compounds. Kerala, Chemistry, 1965-67. Ramachandran Nair, Chandrathil Govindan, Lecturer.

Oxidative studies on elemental sulphur have been undertaken. Oxidative and hydrolytic reactions of sulphur compounds, the uses of N-haloamides as oxidimetric reagents for estimation of sulphur compounds and the reactions of elemental sulphur in solution and in solid state will be studied in detail.

(1) Dichloramine-T as an oxidimetric titrant in non-aqueous medium. Talanta. 12 ; 1965 : p. 1055 ; and (2) Determination of thioacetamide by oxidation with chloramine-T. ibid. 13 ; 1966 : p. 154-156.

546.723

Halogen Group

903.198 Bandorawalla, Jamshed Savax. Studies on metal sub-chlorides. Bombay, Chemical Technology, 1963-67. Altekar, V. A., Professor of Metallurgical Engineering.

It is proposed to gather data of thermodynamic and kinetic nature of the formation of sub-chlorides which could later on be used in employing such transient phase chlorides in metal recovery or refining from scrap, alloys etc. Work has already been done with aluminium and the metal under study now is chromium, to be followed by molybdenum.

546.7322

904.199 Darshan Singh. Physico-chemical studies on the chemistry of sulphur trioxide. Panjab, Chemistry, 1962-67. Paul, Ram Chand, Professor and Head of the Department.

The cryoscopic studies of the compounds of sulphur trioxide with acids, alcohols and esters are being made in dioxane, and the dissociation of these adducts is being postulated. On the basis of the molecular weight determinations, a type of hydrolysis of these adducts will be suggested.

546.7232

Organic Chemistry

General Groupings of Compounds

Oxy & Hydroxy Derivatives

905.200 Ghosh, Tarunkumar. Studies on flusberymic acid. Calcutta, Chemistry, 1962-67. Ray, N. N., Reader.

547.037

906.201 Patel, Saroj Gordhanbhai. Studies in phenylstyryl ketones. Baroda, Chemistry, 1965-67. Sethna, Suresh, Professor.

2, 4-Diacetyl and 4, 6-diacetylresorcinol have been condensed with various aromatic aldehydes and the chalkone derivatives obtained have been cyclised to γ-pyrone derivatives. Further work on the diacetyl derivatives is in progress.

547.036

907.202 Raychaudhuri, S. Effect of IO_4^- on vulpinic acid. Delhi, Chemistry, 1966-69. Seshadari, T. R., Professor Emeritus and Mukerjee, S. K., Reader.

547.037

Nitrogen Derivatives

908.203 Deshpande, Pralhad Hanamantrao. Study of the organic compounds containing nitrogen and sulphur. Nagpur, Chemistry, 1965-68. Sahasrabudhey, R. H., Professor and Head of the Department.

Oxidation of tertiary butyl thiocarbamides has been investigated with respect to 1-phenyl-3-tertiary butyl thiocarbamide and tertiary butyl thiocarbamide. It has been found that the general pattern of oxidation conforms to the other aryl and alkyl substituted thiocarbamides. Further work on the chemistry of isothiocyanates is in progress.

547.04

Metallic Compounds

909.204 Kalyanaraman, V. Studies in organometallic chemistry. I. I. T., Kanpur, Chemistry, 1965-68. George, M. V., Professor.

Addition of alkali metals to unsaturated systems gives rise to radical anions and dianions. The study of these intermediates employing both physical and chemical means is in progress.

547.05

910.205 Muthor, Bhupendra Shanker. Study on rare earth organo compounds. Bombay, Atomic Energy Establishment, Trombay, 1963-67. Jagdish Shankar, Head, Chemistry Division, Atomic Energy Establishment, Trombay.

Stability constants of rare earth and yttrium monochloroacetates, glycinates, malonates, succinates, maleates and phthalates have been determined potentiometrically. Compounds of rare earth and yttrium with trichloroacetic acid, dichloroacetic acid, monochloroacetic acid, glycine, malonic, succinic, maleic, fumeric and phthalic acids have also been prepared and their composition determined. The thermal behaviour of all these compounds is being studied.

547.05

911.206 Siddiqui, Mohammed Shuaib. Studies in some metal complexes of organic bases. Vikram, Govt. Engg. College, Jabalpur, 1966-70. Kaushal, R., Professor of Applied Chemistry, Govt. Engg. College, Jabalpur.

547.05

912·207 Srivastava, K. C. Studies in metal complex compounds. B.I.T.S., Pilani, Chemistry, 1965-69. Banerji, S. K., Assoc. Professor.

Studies are being made on composition, stability, structure and analytical applications of the coloured chelates formed by some hydroxy anthraquinone dyes with various metal ions.

547.05

Sulphur Compounds

913.208 Sukhani Devi. Thio-organic derivatives of some group IV metals. Rajasthan, Chemistry, 1963-67. Mehrotra, Ram Charan, Head of the Department.

Alkyl thiostannane and alkyl thiogermanes have been prepared in good yields and their properties studied. Tetrathiostannane and tetrathiogermanes have also been prepared and studied. Properties of these M-S bonded derivatives have been compared with those of M-O bonded derivatives. Spiro-compounds of Ge, Sn, Zr and Ti are now being prepared with 2-mercaptoethanol, monothioglycerol, thiolactic acid and β-mercapto-perpionic acid.

547.06

Molecular Structure

914.209 Kanakasabapathy, V. M. Studies on structure and reactivity. Annamalai, Chemistry, 1964-68. Ganapathy, K., Reader.

The kinetics of the quaternization of some meta- and para-substituted N,N-dimethylanilines by methyl iodide in methanolic solution are being studied, at different temperatures, to find out whether sulphur, chlorine, bromine and iodine expand their valency shells by the utilization of their vacant d-orbitals.

547.1224

Stereochemistry

915.210 Atmaram, Shiravanthe. Studies in stereochemistry. I. I. S., Bangalore, Organic Chemistry, 1966-69. Bhatt, Mangalore Vivekanand, Assoc. Professor.

The research comprises conformational analysis of some highly substituted and polycyclic cyclohexane

1 : 4-diones; stereochemistry of some six and eight membered heterocycles; and synthesis of disymmetric molecules.

547.1223

916.211 Balasubramanian, K. K. Molecular rearrangement in homocyclic and heterocyclic systems and synthesis of non-benzenoid aromatic compounds. Madras, Organic Chemistry, 1961-66. Thyagarajan, B. S., Reader in Organic Chemistry, A. C. College, Madras.

The molecular arrangement of the following systems has been studied : (1) Claisen rearrangement of 1, 4 diaryloxy-2-butynes to benzofuro (3, 2, C)-(1), (6a, 11a-dihydro-11a-methyl) benzopyran; (2) Different acid catalysed claisen rearrangements of 1, 4-diaryloxy-2-butynes to benzofuro (2, 3,-b) benzofurans and benzofuro (3, 2-b) benzofurans; (3) Novel ring contraction of benzofuro benzopyrans to benzofuro benzofurans; and (4) Claisen rearrangement of 2-methyl-3-phenoxymethyl benzofuran. Synthesis of 1, 6 diaza cyclo deca peta-ine is in progress.

(1) Chem. Ber. 99 ; 1966 : p. 368; and (2) Chem. & Ind. 51; 1966 : p. 2128.

547.1223

917.212 Bhima Rao, R. Molecular rearrangement in homocyclic and hetero cyclic systems and synthetic approaches to novel heteroaromatic systems. Madras, Organic Chemistry, 1961-66. Thyagarajan, B.S., Reader in Organic Chemistry, A. C. College, Madras.

The claisen rearrangement of symmetrical and dissymmetrical 1, 4 diaryloxy cis-and trans 2-butenes has been studied. Para claisen rearrangement with symmetrical 1, 4 (o-disubstituted) 2-butenes and dissymmetrical butenes is being investigated. It is also proposed to study other heterocyclic systems containing oxygen, nitrogen and sulphur.

(1) Tet. Let. 21 ; 1963 : p.1393 ; (2) Tetrahedron. 21; 1965 : p. 2289; and (3) Can. Jour. Chem. 44; 1966 : p. 633.

547.1223

918.213 Narayanan, K. V. Studies in stereochemistry with emphasis on a novel ring enlargement. Madras, Organic Chemistry, 1960-66. Swaminathan, S., Professor.

The compound 2, 4, 6, 2′, 4′, 6′-hexamethyl-3-nitro-3′-carboxymethyl benzophenone has been synthesized and one of the two optically active forms isolated. The generality, scope and limitations of a ring enlargement reaction are being studied.

Synthesis of $\triangle$-1-methylbicyclo (5,4,0) undecene-2, 9-dione and its condensation with acetylene. (with R. Selvarajan, J. P. John and S. Swaminathan). Tetrahedron. 22 ; 1966 : p.949.

547.1223

919.214 Rajaram, J. Molecular rearrangements. Madras, Organic Chemistry, 1966-70. Thyagarajan, B. S., Reader in Organic Chemistry, A. C. College, Madras.

Studies are being made on the intermediates involved in the rearrangement of bisaryloxy-2-butynes to their corresponding benzopyano-benzofurans and benzofuro-benzofurans. The mechanism of ring contraction from benzophyano-benzofurans to coumarano coumarans will also be studied.

547.1223

920.215 Ramani, P. V. Studies related to some molecular rearrangements. Madras, Organic Chemistry, 1966-70 Swaminathan, S., Professor.

Synthesis of 1-vinyl 1-hydroxy-6-oxo 8a-methyl-1, 2, 3, 4, 4a, 5, 6, 8a,-octahydro naphthalene and related enone alcohols have been synthesised and their behaviour when treated with basic and acidic reagents is under study.

547.1223

921.216 Sundara Rajan, P. R. Studies on the conformations of polysaccharides. Madras, Physics, 1966-69. Raghavendra Rao, V. S., Reader.

There are 8 conformations, two chairs and six boats proposed for the glucopyranose ring. To study the best conformation, the coordinates and contact distances have been worked out. The concept of 'short contact' has been used to rule out certain confomations. The allowed ranges of (ϕ,ϕ') when two units are linked have also been calculated. These have been investigated using energy considerations as well choosing proper potential functions. The number of turns 'n' and unit height 'h' are being calculated for the amylose helix for various (ϕ,ϕ') values.

547.1223

Structural Variations

922.217 Gupta, Sukumar. Organic acid complexes of trivalent metals. Calcutta, Chemistry, 1963-67. Datta, Niharkumar, Professor, Indian Association for Cultivation of Science, Calcutta.

547.12253

923.218 Gur, Ishwar Singh. Physico-chemical studies on the degradation of high polymers in solution. Kurukshetra, Chemistry, 1963-67. Bhatnagar, H. L., Professor of Chemistry, Regional Engg. College, Kurukshetra.

Thermal degradation of high polymers has been carried out in dilute solutions and the molecular weight determined by viscosity measurement at constant temperature. Some thermodynamic quantities have also been calculated. Use of vapour phase osmometer is intended to be made for the molecular weight determination.

547.12254

924.219 Kamath, Kundapur Manjunath. Ring-chain tautomerism and related studies. I.I.S., Bangalore, Organic Chemistry, 1962-67. Bhatt, Mangalore Vivekanand, Assoc. Professor.

Structural and environmental effects on ring-chain tautomerism of a number of substituted O-benzoyl benzoic acids and their derivatives have been investigated. Hammett's free-energy relationship has been shown to be applicable to the tautomeric equilibria of these acids. Reactions of pseudo acid chloride of O-benzoyl benzoic acid with a number of nucleophiles are being investigated.

(1) Tet. Let. 32 ; 1966 : p.3885-3890 ; and (2) ibid. 44 ; 1966 : p.5413-5419.

547.12252

925.220 Satyanarayana Sastry, K. Study of solution properties and morphology of isotactic polybutene-1. Patel, Chemistry, 1965-68. Patel, R. D., Professor and Head of the Department.

Work is being done on the properties of isotactic polybutene-1 polymer. It has been fractionated and the viscosity of different fractions measured in cyclohexane at different temperatures. Crystals of the polymer have been grown from dilute solutions and their structures studied on incident light microscope and electron microscope.

547.12254

926.221 Sengupta, Pranab Kumar. Some investigations on polymer characterisation. Calcutta, Chemistry, 1963-67. Ghosh, Pranomay, Professor, Presidency College, Calcutta.

547.12254

927.222 Shanti Sarup. Radiation effects in metal chelates. Poona, Chemistry, 1962-66. Jagdish Shankar, Head, Chemistry Division, Atomic Energy Establishment, Trombay.

The kinetics of isothermal annealing of recoil damage in neutron irradiated tris-acetylacetone Co(III) in the presence of O_2 (air) and in an inert ambient have been investigated. Isotopic exchange between Co^{++} ion and the parent complex has been observed and the correlation between isothermal annealing and isotopic exchange will be examined.

Ind. Jour. Chem. 4(2) : p.51-56.

547.12253

928.223 Vasudevan, Padma. High polymer systems. Madras, Physical Chemistry, 1964-68. Santappa, M., Professor.

Thermodynamic parameters of high polymer systems have been evaluated by precipitation and viscometric methods and compared with those obtained by osmometry, light scattering etc.

547.12254

Solutions

929.224 Chougaonkar, Ramesh Khanderao. Studies in rheochor : Its use in investigation of complexes by Job's method of continuous variation and in computing viscosities of mixtures. Jiwaji, Chemistry, 1965-67. Bhatnagar, R. P., Asstt. Professor.

Rheochor is being used as an additive physical property in studying : (a) Molecular organic complexes in different solvents ; (b) Metal glycine complexes in aqueous medium ; and (c) Viscosities of liquid-liquid mixtures where viscosity differences are large. Shukla-Bhatnagar equation will be studied critically.

Jour. Ind. Chem. Soc. 40 ; 1963 : p. 839-842.

547.13413

930.225 Kamat, P. V. Solution stability constants of some metal complexes of certain aromatic ketones. Bombay, Institute of Science, 1963-67. Datar, M. G., Professor.

Solution stability constants of o-hydroxy acetophenone and its substituted derivatives, substituents being ethoxy, methoxy, methyl, hydroxy, benzyloxy and chloro-groups in various positions in the aromatic nucleus, with the metals—Cu, Zn, Cd, Hg, Fe, Co, Ni, Mg, Mn, Ca, Ba and Sr—have been studied. The effect of the substituents and positions will be established.

547.1341

931.226 Laxmeshwar, N. B. Solution stability constants of some metal complexes of certain aromatic ketones. Bombay, Institute of Science, 1964-68. Datar, M. G., Professor.

Solution stability constants of the aromatic ketones with various substituents in the aromatic nucleus and their complexes with the metals of the transition elements have been studied spectrophotometrically. The relationship between the structure of the ligand and the physical properties of the complexing metal ion has been established.

547.1341

932.227 Patel, Chimanlal Khodidas. Thermodynamic properties of solutions of amylose derivatives. Patel, Chemistry, 1962-66. Patel, R. D., Professor and Head of the Department.

Attempts have been made to investigate the steric effect of the perdant group (or solvent) on the amylosic chains. Mainly, the benzoate derivative of amylose extracted from Potato starch has been investigated. The flow behaviour of amylose-benzoate solution in different solvents at different temperatures has been studied. Osmotic behaviour has also been studied and L. S. measurements made to find out various relations between the molecular properties and molecular dimensions. Various theories of solutions and second virial coefficient have to be applied to the experimental data.

547.13416

Colloidal Chemistry

933.228 Arora, Jai Pal Singh. Physico-chemical studies on the interaction of inorganic colloids, poly-and heteropoly acids with proteins. Roorkee, Chemistry, 1966-67. Malik, Wahid-uddin, Professor and Head of the Department.

The following studies have been undertaken to investigate the binding of different elements: (1) pH-metric study of the binding of TiO_2 solution, ZrO solution, Molybdic acid solution, Silicic acid and Tabaseer solution with proteins ; (2) Quantitative pH- metric study of the binding of Al^{3+}, Fe^{3+}, and Cr^{3+} with transfusion gelatin; (3) Qualitative pH-metric study of the binding of molybdate, Ce^{++}, Hg^{++}, and Pd^{++} with soyabean and T. gelatin; and (4) Turbedometric study of the binding of TiO_2 solution, molybdic acid and silicotungstic acid with gelatin, T. gelatin and egg albumin.

547.134513

934.229 Sharma, Neel Kanth. Precipitation study on organic colloids and gelation phenomenon. Jammu & Kashmir, Chemistry, 1966-69. Bhattacharaya, Abnai Kumar, Head of the Department.

Experiments have been carried out on the coagulation of colloids, the time of coagulation being varied from minutes to hours and to days. The constants of the well-known Bhattacharya's equation will be derived in different solution systems and discussed for various electrolytes.

547.1345

Surface Chemistry

935.230 Bakhru, Jiwat Mool Chand. Study in bi-ionic membrane potential and determination of dissociation constants of various complex ions by membrane potential method. Bombay, D. & H. National College, Bombay, 1963-67. Narwani, Chuharmal Suritram.

Thin membranes of esterified denatured ovalbumin and deaminated denatured ovalbumin have been used to determine the concentration of anions and cations respectively in a given mixture of two alkali salts by determining bi-ionic and multi-ionic membrane potentials.

547.13453

936.231 Garg, Shailendrakumar Jagdishprakash. Studies in membrane potential of denatured esterified and deaminated globin films at different pH, and determination of concentration of anions and cations in solutions and mixtures. Bombay, D. & H. National College, Bombay, 1964-67. Narwani, Chuharmal Suritram.

Thin membranes of (1) Denatured globin, (2) Esterified, denatured globin, and (3) Deaminated, denatured globin have been used to determine the membrane potentials at different pH while isoelectric point of denatured globin has been determined from the plot of membrane potential against pH. The concentration of anions and cations respectively have been determined from membrane potentials in case of solutions and mixtures of various salts.

547.13453

Photochemistry

937.232 Desai, Ashvinkumar Prembhai. Preparation of optically active compounds and the study of the reaction mechanism by using optically active compounds. Gujarat, Chemistry, 1966-69. Thaker, K. A., Reader.

Resolution of recemic mixtures and role of optically active compounds in the preparation of certain useful compounds by various reaction mechanism are being studied. Chaulmeogric acid has been obtained from chaulmeogra oil by hydrolysis of the oil followed by fractional distillation of esters of mixed acids obtained by hydrolysis. From this acid, various optically active anilides, esters, ketones and tertiary alcohols will be prepared.

547.135

938.233 Mishra, Amar Nath. Photolysis and radiolysis of some organometallic compounds in organic liquids. Rajasthan, Chemistry, 1966-68. Rai, Rama Shanker, Lecturer.

Solutions of some organometallic compounds, like the polyphenyls of zinc, cadmium, mercury, silicon, germanium, tin, lead, phosphorous, arsenic and antimony, in organic liquids, such as, benzene, toluene etc., will be irradiated with ultraviolet rays, X-rays and gamma-rays. The products of irradiation will be detected and determined, the kinetics of the reactions studied, and the mechanism of the reactions put forward.

547.135

939.234 Mistry, Naginbhai Nathubhai. Preparation of optically active compounds and the study of reaction mechanisms. Gujarat, Chemistry, 1966-69. Thaker, K. A., Reader.

Resolution of recemic mixtures and role of optically active compounds in the preparation of certain useful compounds by various reaction mechanisms are being studied. Optically active (+) β methyl valeric acid has been prepared from optically active (—) 2 methyl -I-butanol, through its halide followed by Grignard reaction. From this acid, various optically active anilides, esters, ketones and tertiary alcohols will be prepared.

547.135

940.235 Pal, Ramprasad. Studies of adsorbed monolayers in the interfacial phase. Jadavpur, Physical Chemistry, 1966-67. Chattoraj, D. K., Lecturer.

Surface tensions of dibasic acids e.g. azelaic acid, sabecic acid etc., have been measured at different pH using a definite salt concentration by drop weight method. Corresponding surface pressure (π) and surface area (A) of these acids have been determined. Interfacial tensions of these acids in the oil (petroleum ether) water interface are also being determined.

547.13453

941.236 Shaikh, Ahmedhusen A. Studies on optical activity and mechanisms. Gujarat, Chemistry, 1962-67. Thaker, K. A., Reader.

The research comprises optical resolution of some tertiary alcohols containing n-octyl group, and preparation of optically active (i) hydroxy esters by Reformatsky reaction, (ii) 5- substituted rhodenines as anticonvulsants, (iii) unsymmetrical ketones from (+)-acid halide by Grignard and Friedel-Craft reactions, (iv) ketonic ethers through cyanoethylation, and (v) glycidic esters by Darzen condensation.

547.135

Thermodynamics

942.237 Sharma, Subhash Chander. Thermodynamic studies of solutions of polyoxyethylene glycol in water and benzene. Panjab, Chemistry, 1962-66. Lakhanpal, M. L., Reader.

In order to test the validity of various theories of polymer solutions, the research is being carried out on thermodynamics of polymer solutions. The differential vapour pressure and calorimetric measurements have been made on polyoxyethylene glycol solutions in water and benzene. From this data, it will be possible to determine the thermodynamic and excess thermodynamic functions, polymer solvent interaction constant X and the interchange energy W. A comparison shall be made between experimental and theoretical values.

547.1369

943.238 Soni, Ram Narayan. Spectrophotometric determination of thermodynamic ionization constants of organic acids and their metal complexes in aqueous medium. B. I. T. S., Pilani, Chemistry, 1963-67. Gupta, S. L., Head of the Department.

Thermodynamic ionization constants of some of the organic acids have been determined spectrophotometrically. The effects of ionic strength and temperature on these acids have been studied and from this data the thermodynamic functions caculated. The pK_a values have also been obtained in different methanol-water mixtures. The complexes of some hydroxy acids with various metal ions are also being studied in aqueous medium.

547.1369

Electrochemistry

944.239 Bhat, Venkataramana C. Some studies with ion-exchange resins. Baroda, Chemistry, 1966-68. Bafna, S. L., Reader.

Ion-exchange studies, both static and dynamic, of four cinchona alkaloid sulphates have been done using different resins in different forms. Extraction of the cinchona alkaloids from the raw materials is under investigation.

547.13723

945.240 Chidambaram, Sankaranarayana Iyer. Studies on organic electrode processes. Kerala, Central Electrochemical Research Institute, Karaikudi, 1964-68. Udupa, H. V. K., Deputy Director, Central Electrochemical Research Institute, Karaikudi.

Studies on the reaction mechanism of certain organic electrode reactions using rotating microelectrode have been carried out. Electrolytic regeneration studies are being made of some oxidising agents, like chromic acid, manganic sulphate etc., which can be used for the preparation of some organic compounds. Electrolytic thiocyanation and halogenation reactions of organic compounds will also be studied.

547.13724

946.241 Chowrashi, Prakash Kumar. Electrophoresis of adsorbed nucleic acids and proteins. Jadavpur, Physical Chemistry, 1963-66. Chattoraj, D. K., Lecturer.

Electrophoretic mobilities of nucleic acid adsorbed on solid charged particles have been measured and it has been found that nucleic acid is really adsorbed on positively charged alumina surface and to some extent on glass surface. Genetically variant β -lacto-globulin and hemoglobins adsorbed on solid substrates have been measured electrophoretically and compared critically.

547.137

947.242 Jana, Debabrata. Thermodynamic properties of hydrogen halides in propylene glycol and its aqueous mixtures. Jadavpur, Physical Chemistry, 1965-68. Das, M. N., Reader.

Standard potentials of Ag-Agcl, Ag-Agbr and Ag-AgI electrodes in propylene glycol and its aqueous mixtures are being determined at different temperatures. Allied thermodynamic quantities e. g. activity coefficients, relative partial molal heat contents, free energy and entropy of transfer of the hydrogen halides from water to the different media etc., will be computed from these standard potentials.

547.13746

948.243 Kamath, Raghavendra Bola. Studies in ion-exchange. Baroda, Chemistry, 1966-68. Bafna, S. L., Reader.

Ion-exchange studies, both static and dynamic, of four cinchona alkaloid sulphates have been done using different resins in different forms. Extraction of the cinchona alkaloids from the raw materials is under investigation.

547.13723

949.244 Sen, Utpal. Thermodynamic properties of some halides in ethylene glycol and its aqueous mixtures. Jadavpur, Physical Chemistry, 1962-66. Das, M. N., Reader.

Standard potentials of silver-silver halide electrode in ethylene glycol and glycol water mixtures have been determined at five temperatures and related thermodynamic quantities evaluated. The electrostatic and chemical contributions of the free energy and entropy of transfer of HCl from water to the other media have also been evaluated and the results interpreted in terms of the liquid structure. Activity coefficients of some alkali halides are being evaluated in ethylene glycol.

547.13746

950.245 Sivaramaiah, Guntur. Studies in electro-oxidation and attendant electrode phenomena. Venkateswara, Chemistry, 1964-67. Rama Krishnan, Vattarmadom, Reader.

The studies are being carried out mainly by the controlled potential coulometric technique on some chosen organic compounds capable of oxidation at an anode. Establishment of conditions, like the optimum working electrode potential, medium, maximum limits of determination, mechanism of the overall reaction and some physico-chemical studies are under investigation.

547.13724

951.246 Tewari, Chandidas. Electrochemical properties of ion-exchange resin. Burdwan, Chemistry, 1965-67. Seal, Bejoy Kumar, Lecturer.

Electrochemical properties of commercial resin membranes and resin membranes prepared in the laboratory are under study. An attempt is being made to extend their utility for theoretical work. It is also proposed to prepare newer types of resin membranes from commercial resins with inert binder i.e. polystyrene etc., under pressure and to study their electrochemical properties.

547.13723

952.247 Yeola, Ekanath Dagadu. Dipole moment and absorption spectra. Poona, Chemistry, 1965-68. Phansalkar, Vijay Keshav, Reader.

Dipole moments of organic compounds have been determined in different solvents and the values thus obtained are being explained in the light of their molecular structure.

547.1377

Magnetochemistry

953.248 Abubucker, M. Mohamed. Diamagnetic susceptibilities of some organic compounds. Annamalai, Chemistry, 1964-68. Baliah, V., Professor and Head of the Department.

A number of substituted alkyl aryl sulphides, sulphoxides, sulphones, thiophenols, trialkylphosphines and arsines have been prepared and their diamagnetic susceptibilities determined to study the nature of bonding of oxygen with sulphur, phosphorus and arsenic.

547.1378

954.249 Gupta, Radha Raman. Role of the environment on magnetochemical studies of some organic derivatives. Rajasthan, Chemistry, 1965-68. Mital, Ram Ji Lal, Reader.

The effect of anisotropy, concentration, temperature variation, conjugation and resonance etc., will be systematically analysed on a number of organic derivatives having different types of the bondings to study the role of the environment on diamagnetism. The experimental results will be analysed from the wave chemically calculated data.

Ind. Jour. Chem. 4(8) ; 1966 : p. 370-371.

547.1378

955.250 Sabesan, R. Magnetic and spectroscopic studies of phenolic compounds. Annamalai, Physics, 1963-67. Sriraman, S., Professor and Head of the Department.

The magnetic susceptibilities of isomeric phenols, nitrobenzenes, aminobenzenes and bromobenzenes have been determined to study the manifestations of the position of the substituent group of magnetic susceptibility. Their temperature variations have also been studied. The binary systems of phenol complexes are being studied magnetically to correlate them with Raman and infrared data.

(1) Diamagnetic study of positional isomerism. Trans. Faraday Soc. 58 ; 1962 : p. 1080 ; (2) Magnetic study of nitro-group. Bull. Chem. Soc. Japan. 36 ; 1963 : p. 1080 ; (3) The diamagnetic study of the nature of association of acetic acid. Part II : The binary systems of acetic acid with triethylamine, pyridine and aniline. ibid. 38 ; 1965 : p. 1391 ; and (4) Formation constants of 1:1 and 1:2 complexes of methyl ethyl ketone and acetophenone with phenol. Jour. Chem. Phys. 63;1966 : p. 16.

547.1378

Reaction Kinetics & Mechanisms

956.251 Acharya, Dipak. Kinetics and mechanism of addition at carbon-carbon double bond. Jadavpur, Physical Chemistry, 1961-66. Das, M. N., Reader.

The kinetics of addition of mercuric acetate to α, β-unsaturated carbonyl compounds have been studied and the mechanism established. Attempts have been made to correlate the activation energy and entropy of activation with structural factors. The kinetics of bromine in aqueous medium to some α, β -unsaturated compounds have also been studied. The addition of morpholine and thioglycolic acid to carbon-carbon double bond is being studied kinetically to elucidate the mechanism.

547.1393

957.252 De, Sadhankumar. The kinetics of interaction between dye base and alcohols in benzene and other solvents. Calcutta, Chemistry, 1964-69. Palit, S. R., Professor, Indian Association for Cultivation of Science, Calcutta.

547.139

958.253 Rajasekharan Nair, Madhavan Pillai. Electrophilic catalysis in solvolytic reactions. Kerala, Chemistry, 1964-66. Anantaraman, Ramaswamy, Professor.

The effect of mercuric chloride (catalyst) on the solvolysis of p-alkyl 1-phenyl ethyl chlorides is being studied. This is to get the kinetic evidence for the inductomeric effect of four alkyl groups, methyl, ethyl iso-propyl and tert-butyl. The effect of added ions, common and non-common, on solvolytic reactions is also under study.

547.1395

959.254 Roy, Apurba Kanti. Studies in kinetics of ionic reactions. Jadavpur, Chemistry, 1964-67. Das, M. N., Reader.

The rates of alkaline hydrolysis of acetyl salicylate and acetyl mandelate have been studied and found to depend upon the charge, characteristics and concentration of added cations and not on the total ionic strength. Acetyl mandelate has also been studied in isocomposition and isodielectric media, specific media effect and dependence on charging dielectric cost.

547.139

Optical Activity

960.255 Sengupta, Swapan Kumar. Study of the luminescence characteristics of rare-earth complexes. Jadavpur, Physical Chemistry, 1966-68. Rohtagi, K. K., Reader.

Chelates of rare-earth elements have the possibility of being used as laser materials. A project has been taken up to study the luminescence behaviour of some new complexes of lighter R. E. which are available in this country. The study will involve the phenomenon of intramolecular energy transfer, internal quenching, intersystem crossing, life time measurement, quantum yield etc.

547.17

Synthesis & Named Reactions

961.256 Acharyya, Himansu Bhushan. Extension of Diels-Alder reaction. Burdwan, Chemistry, 1966-69. Bhattacharyya, Anathjiban, Lecturer.

The synthesis of a number of interesting hydrocarbons, such as, fluorine, phenanthrene, derivatives with fused cyclopentane ring and some non-benzenoid aromatic hydrocarbons, has been attemted mainly by the application of diene synthesis. Dicarboxylic anhydrides, such as, $\triangle^1$ cyclopentene, 1, 2 dicarboxylic anhydride, indene 1, 2-dicarboxylic anhydride, accnaphthylene 1, 2-dicarboxylic anhydride etc., are being used in the process as dienophiles.

547.2

962.257 Shaista Bano. Studies in synthetic organic chemistry. Aligarh, Chemistry, 1966-69. Kidwai, A. R., Professor and Head of the Department.

547.2

963.258 Shitoot, Anant Purushottam. Study of some organic reactions by physico-chemical methods. Vikram, Chemistry, 1965-69. Bhagwat, W. V., Professor and Head of the Department.

547.2

964.259 Surendranath, Venkataramana Iyer. Synthetic organic chemistry. I. I. S., Bangalore, Organic Chemistry, 1966-72. Banerjee, Dilip Kumar, Professor.

547.2

Alkylation, Acylation & Aromatisation

965.260 Dhawan, K. L. Optically active compounds and organic mechanism. I. I. T., Delhi, Chemistry, 1965-69. Norula, J. L., Asstt. Professor.

The research deals with the Wittig rearrangement of optically active ethers and establishment of the mechanism of reaction.

547.21

966.261 Gudi, M. N. Reactions of acetylenic esters. I.I.T., Kanpur, Chemistry, 1965-68. George, M. V., Professor.

The stereochemistry of the addition of several nucleophiles to dimethy acetylenedicarboxylate has been studied in detail. The addition proceeds by a transfusion giving rise to mainly fumerates. These fumerates have been employed in the synthesis of several cyclic systems.

547.21

967.262 Handa, Ram Nath. Studies on cationoid alkylation and cyclialkylation. Kurukshetra, Chemistry, 1963-67. Mukherji, S. M., Professor and Head of the Department.

The scope of Colonge-Mukherji alkylation and cyclialkylation is being extended for the synthesis of polycyclic aromatic hydrocarbons.

547.21

968.263 Khetan, S. K. Reactions of acetylenic esters. I. I. T., Kanpur, Chemistry, 1965-67. George, M. V., Professor.

Nucleophilic addition of phenacylanilines to dimethyl acetylenedicarboxylate results in the formation of anilinofumerates. These anilinofumerates have been cyclized to give pyrrole derivatives, using both acid and base as catalysts.

547.21

969.264 Rengaraju, Srinivasan. Studies in Wolff-Semmler reaction. I. I. S., Bangalore, Organic Chemistry, 1962-67. Bhatt, Mangalore Vivekanand, Assoc. Professor.

The mechanism of Wolff-Semmler aromatisation of oximes to amines is being studied and the development of 'a new dehydrogenation sequence' explored.

Tet. Let. 37; 1964 : p. 2623-2626.

547.21

970.265 Samanta, Subhashranjan. Studies in Friedel-Craft reaction of some aliphatic dicarboxylic acid halides with various phenols and phenyl ethers. Calcutta, Pure Chemistry, 1964-68. Chakravarti, D., Professor and Head of the Department.

547.21

971.266 Shah, A. Photochemical cycloadditions. I. I. T., Kanpur, Chemistry, 1964-67. George, M. V., Professor.

Photochemical cycloadditions of reagents, like diethylazodicarboxylate with olefins, dienes etc., have been attempted. These additions give rise to products which are different from the thermally induced additions. The stereochemistry and mechanism of these additions have been studied.

547.21

972.267 S. N. Singh. Cycloadditions. I. I. T., Kanpur, Chemistry, 1966-69. George, M. V., Professor.

Cycloadditions of several dienophiles and dipolarophiles to dienes and dipolar species are under investigation.

547.21

973.268 Subarao, K. Photochemical cycloadditions of nitro compounds. I.I.T., Kanpur, Chemistry, 1965-68. George, M. V., Professor.

Photochemical cycloadditions of nitro compounds to unsaturated systems lead to products arising out of an initial addition followed by rearrangements. A detailed study of these additions is being attempted.

547.21

Halogenation, Hydrolysis & Saponification

974.269 Jagdale, Mansinghrao Hindurao. Mechanism of the hydrolysis of some lactams. Jiwaji, Chemistry, 1965-67. Mhala, M. M., Professor.

The kinetics of the hydrolysis of different lactams are being studied under varied pH values. The criteria, such as, salt effect, Debye-Hückel relationship at constant ionic strengths, Hammett acidity function, Zucker Hammett hypothesis, isotopic runs, determination of Arrhenius parameters etc., will be used to elucidate the mechanism.

547.225

975.270 Misra, Jagdish Prasad. Mechanism of the hydrolysis of some lactides. Jiwaji, Chemistry, 1965-67. Mhala, M. M., Professor.

The kinetics of the hydrolysis of different lactides are being studied under varied pH values. The criteria, such as, salt effect, Debye-Hückel relationship at constant ionic strengths, Hammett acidity function, Zuker Hammett hypothesis, isotopic runs, determination of Arrhenius parameters etc., will be used to elucidate the mechanism.

547.225

976.271 Patwardhan, Madhukar Dattatraya. Hydrolysis of organic phosphates. Jiwaji, Chemistry, 1965-67. Mhala, M.M., Professor.

The kinetics of the hydrolysis of aromatic organic orthophosphates are being studied under different pH values. The criteria, such as, salt effect, Debye-Hückel relationship at constant ionic strengths, Hammet acidity functions, Zucker Hammett hypothesis, isotopic runs, determination of Arrhenius parameters etc., will be used to elucidate the probable mechanism. Polar effects of different substituents will also be studied.

547.225

977.272 Saxena, Sharda B. The kinetics of some unsaturated orthophosphate esters. Jiwaji, Chemistry, 1965-67. Mhala, M. M., Professor.

The kinetics of the hydrolysis of allyl and cinnamyl orthophosphates are being studied under different pH values. The criteria, such as, salt effect, Debye-Hückel relationship at constant ionic strengths, Hammett acidity functions, Zucker Hammett hypothesis, isotopic runs, determination of Arrhenius parameters etc., will be used to elucidate the probable mechanism.

547.225

978.273 Venkateswara Rao, G. Monohydroxylation of unsaturated glycerides. Aligarh, Chemistry, 1966-69. n.g.

547.225

979.274 Viswanathan, Sesha Iyer. The kinetics of halogenation of organic compounds. Madras, Physical Chemistry, 1966-70. Ganesan, R., Lecturer.

The kinetics of the addition of bromine and chlorine to unsaturated organic compounds are being studied in the gas phase and in solution and a comparison of the results will be made. Attempts will also be made to get more information regarding the mechanism of the process.

547.223

Oxidation & Reduction

980.275 Balachandran, K. Oxidation of organic compounds. I.I.T., Kanpur, Chemistry, 1966-69. George, M. V., Professor.

Oxidation of several organic substrates employing metal oxides, lead tetra-acetate, ozone etc., is being studied to elucidate the mechanism of these additions.

547.23

981.276 Bhatnagar, Ila. Oxidation with metal oxides. I. I. T., Kanpur, Chemistry, 1965-67. George, M. V., Professor.

Oxidation of several organic substrates, like phenylhydrazones, pyrazolines, Schiff's bases, diamines etc., has been carried out using metal oxides under neutral conditions. A free-radical mechanism is operating in most of these cases.

Jour. Org. Chem. 32 ; 1967 : p. 2252.

547.23

982.277 Chohan, Ram Kishore. The kinetics of the oxidation of thiols. Jodhpur, Chemistry, 1965-67. Kapoor, Ramesh Chandra, Head of the Department.

The kinetics of oxidation of various thiols, like mercapto-ethylamine hydrochloride and dimethylamino ethane thiol hydrochloride, with potassium ferricyanide have been carried out under varied conditions. These investigations throw light on the mechanism of oxidation of thiols and their exchange reactions. The reaction is being followed spectrophotometrically.

547.23

983.278 Dwivedi, Vijai Raj. The kinetics of oxidation of organic compounds by hydrogen peroxide catalysed by transition metal ions. Udaipur, Chemistry, 1965-67. Bakore, G. V., Professor of Chemistry, M. B. College, Udaipur.

Oxidation of organic compounds by hydrogen peroxide catalysed by metal ions is being investigated to elucidate the mechanism of oxidation.

547.23

984.279 Gupta, Arun Kumar. Studies in oxidation of organic compounds by ceric ions. Jabalpur, Chemistry, 1965-67. Bose, S., Reader.

Solution of ceric perchlorate has been prepared by dissolving ceric ammonium nitrate in perchloric acid and its stability, on keeping, determined. It has been used as oxidant for CH_3OH, C_2H_5OH, HCHO and CH_3CHO. The reaction kinetics have been studied in the dark as also in the ultraviolet light.

547.23

985.280 Iyer, Ramnath V. The kinetics of the oxidation of some hydroxy acids by potassium persulphate. Jiwaji, Chemistry, 1964-66. Mhala, M. M., Professor.

A study of the oxidation of hydroxy acids with groups of different polar effects has been undertaken to throw light on the mechanism which will be studied by kinetic methods.

Ind. Jour. Chem. 3(12) ; 1965 : p. 568-569.

547.23

986.281 Jamuna Prasad Singh. Oxidation of thiosulphate. Bhagalpur, Chemistry, 1964-66. Gyani, B. P., Head of the Department of Chemistry, Ranchi University.

Investigations in chemical reaction mechanism have been carried out potentiometrically with organic-inorganic systems. It is now proposed to investigate such reactions with inorganic-inorganic systems. These investigations will throw light on the short lived radicals and compounds of the chemical reactions.

547.23

987.282 Kachhwaha, Om Prakash. The kinetics of the oxidation of thiols by ferricyanide ion. Jodhpur, Chemistry, 1964-67. Kapoor, Ramesh Chandra, Professor and Head of the Department.

The kinetics of the oxidation of thiomalic acid, thiolactic acid and thioglycolic acid have been carried out in acid and alkaline medium using potassium ferricyanide as oxidant. The reaction has been followed calorimetrically. The effect of adding neutral salts, pH variation and temperature variation has been studied on the rate of the reaction. The mechanisms of their oxidation have also been suggested.

547.23

988.283 Khan, Imam. Oxidation of certain organic compounds by ceric perchlorate. Jabalpur, Chemistry, 1965-67. Bose, S., Reader.

When the oxidation of methyl, ethyl, n-propyl, n-butyl and benzyl alcohols is done by ceric perchlorate as oxidant, corresponding acids i.e. formic, acetic, propionic, butyric and benzoic are produced respectively. By this procedure micro determination of alcohols has successfully been done and the error does not exceed 1%.

547.23

989.284 Kudesia, Virendra Prakash. Mechanism of oxidation by chlorine. Roorkee, Chemistry, 1965-67. Mukherjee, S. K., Lecturer.

The kinetics of the reactions of various alcohols and aldehydes with chlorine have been studied in detail. The effect of the structure of organic molecule on the rate of reaction is being studied. The chlorine has been investigated at various concentrations and thermodynamic activation parameters have been calculated. The investigation includes the determination of order of reaction, the influence of ionic strength, catalytic effect, isolation and estimation of the products of the reaction etc. Mechanism of oxidation with chlorine has been proposed.

547.23

990.285 Madhavan Kaimal, Parameswaran. Cerium and titanium compounds in organic oxidation-reduction reactions. Kerala, Chemistry, 1961-66. Moosath, Subramoniam Subramonian, Reader.

Investigations are being carried out to study the possible uses of cerium and titanium compounds for specific and selective oxidation-reduction of organic compounds. Several reactions have been studied under aqueous and non-aqueous conditions.

Elimination of phosphate, fluoride and oxalate radicals by mixed rare earth chloride in inorganic qualitative analysis. Jour. Sci. Ind. Res. 21B (7); 1962 : p.337-338.

547.23

991.286 Modi, Awant Prakash. Oxidation of organic compounds by monovalent silver. Jabalpur, Chemistry, 1963-66. Ghosh, Satyeshwar, Professor and Head of the Department.

The velocity and mechanism of oxidation of some monosaccharides, a disaccharide, polyhydric alcohol and also a dihydroxy dicarboxylic acid have been studied by ammoniacal silver nitrate solutions.

547.23

992·287 Puri, Bhawani. Kinetic investigation of the oxidation of aldehydes by manganic ions. Udaipur, Chemistry, 1965-67. Bakore, G. V., Professor of Chemistry, M. B. College, Udaipur.

Oxidation of aldehydes may proceed through enol form or may involve direct attach on aldehydes. The purpose of the investigation is to elucidate the mechanism of oxidation of aldehydes by manganic ions.

547.23

993.288 Sabesan, Arunachalam. Studies on oxidation. Madras, Vivekananda College, Madras, 1965-68. Venkatasubramanian, Nagaswami, Professor and Head of the Department of Chemistry, Vivekananda College, Madras.

The kinetic studies of uncatalysed and silver catalysed oxidation of several secondary alcohols, hydroxy acids and their derivatives by peroxydisulphate are being carried out in order to arrive at the mechanism of the oxidation. Conformational aspects of the problem as also the influence of medium acidity and salts on the oxidation are also being studied.

547.23

994.289 Singhal, Suresh Kumar. Mechanism and oxidation of organic compounds by persulfate ion. Roorkee, Chemistry, 1966-68. Srivastava, S. P., Reader.

The mechanism of oxidation of some organic compounds, such as, phenols, benzoic and acetone etc., by persulfate ion has been studied and the products have been identified.

547.23

995.290 Srinivasan, Gopalaswami. The kinetic studies in oxidation. Madras, Vivekananda College, Madras, 1964 - 67. Venkatasubramanian, Nagaswami, Professor and Head of the Department of Chemistry, Vivekananda College, Madras.

The effect of conformation on the reactivity and mechanism of oxidation of alicyclic and terpenoid secondary alcohols by chromic acid is being investigated. Solvent and substituent effects and the effect of medium acidity on the oxidation of alcohols are being examined. X-ray, infrared and Raman spectra measurements will be made to arrive at the conformation of some of the molecules.

Tetrahedron. 21 ; 1965 : p.291.

547.23

996.291 Sundaram, Srinivasan. Studies in oxidation. Madras, Vivekananda College, Madras, 1964-67. Venkatasubramanian, Nagaswami, Professor and Head of the Department of Chemistry, Vivekananda College, Madras.

The kinetics and mechanism of the chromic acid oxidation of α-hydroxy acids and their derivatives are being investigated. The substituent and solvent isotope effects will throw light on the nature of the transition state and the bonds being broken therein. The intermediate valence states of chromium in the reaction will be identified by complexometric methods.

(1) Curr. Sci. 33 ; 1964 : p.646 ; and (2) ibid. 34 ; 1965 : p. 662.

547.23

997.292 Thiagarajan, Venkataraman. Structural and solvent influences in some oxidation reactions. Madras, Vivekananda College, Madras, 1965-68. Venkatasubramanian, Nagaswami, Professor and Head of the Department of Chemistry, Vivekananda College, Madras.

The kinetics and mechanism of oxidation of alcohols by molecular bromine and N-bromosuccinimide are being studied from the point of view of structural solvent and isotope effects. The conformational aspects of the problem are also being examined. The oxidation of diols by these reagents is also treated kinetically as a consecutive reaction to isolate the first and second step constants from one and the same kinetic run.

547.23

998.293 Vivekanandan, S. Study of oxidation-reduction systems involving thiols. Madras, Pachaiyappa's College, Madras, 1965-68. Shanmuganathan, Sp., Professor and Head of the Department of Chemistry, Pachaiyappa's College, Madras.

Certain oxidation-reduction systems involving chloro, nitro, amino, and-SO_2R (R=alkyl or aryl) substituted phenols and thiols have been taken up for physico-chemical study. Their oxidation and reduction potentials and dissociation constants are being determined by both polarographic and potentiometric methods. The effect of substituents on these physico-chemical properties is to be investigated systematically and it constitutes the major point of interest in the present study.

547.23

Polymerization

999.294 Bhattacharyya, Saktipada. Synthesis of polynuclear compounds. Calcutta, Chemistry, 1964-67. Chatterjee, D. N., Professor, Presidency College, Calcutta.

547.28

1000.295 Chaudhuri, Ajitkumar. Cross termination in copolymerization. Calcutta, Chemistry, 1963-68. Palit, S. R., Professor, Indian Association for Cultivation of Science, Calcutta.

547.28

1001.296 Das, Rajat Kumar. Aqueous polymerization initiated by hydrazine system. Calcutta, Chemistry, 1963-67. Palit, S. R., Professor, Indian Association for Cultivation of Science, Calcutta.

547.28

1002.297 Datta, Prabirkumar. Studies on polymerization with special reference to initiation by compounds containing $C=O$ groups. Calcutta, Chemistry, 1963-67. Palit, S. R., Professor, Indian Association for Cultivation of Science, Calcutta.

547.28

1003.298 Ghosh, Shyamal. Aqueous polymerization initiated by phenyl hydrazine system. Calcutta, Chemistry, 1964-68. Palit, S. R., Professor, Indian Association for Cultivation of Science, Calcutta.

547.28

1004.299 Radhakrishnan Nair, Sankara. Studies on condensation polymerization. Kerala, Chemistry, 1963-67. Thampy, Ramakrishna Thrivikraman, Asstt. Director, Shri Ram Institute for Industrial Research, Delhi.

The work consists of synthesis and characterisation of novel condensation polymers especially certain polyesters ; study of characteristics like kinetics of reactions and influence of catalysts on the reactions involved; and correlation of certain physical properties of these polymers with their chemical constitution.

(1) Ind. Jour. Tech. 2(7) : p.236-239 ; and (2) ibid. 3(6) : p.198-199.

547.28

General Reagents

1005.300 De, Amrita Lal. Studies of some indicators in organic and aquo-organic solvents. Jadavpur, Physical Chemistry, 1966-69. Kundu, K. K., Lecturer.

pK values of three indicator acids of three charge types i.e. $A^{+}B^{\circ}$, AB^{-} and AB^{-}, have been measured in ethylene glycol water solvents of different compositions. A quantitative explanation of the variation of pK values with change of solvent composition has been obtained. Similar studies in propylene glycol-methanol mixtures are in progress.

547.301

1006.301 Gupta, B. D. Organic reagents in chemical analysis. Roorkee, Chemistry, 1965-67. Malik, wahid-uddin, Professor and Head of the Department and Gupta, D.R., Head of the Department of Chemistry, U.P. Agricultural University, Pantnagar.

Hydroxy-ketoximes and their derivatives are being exploited to estimate less common metals.

547.301

1007.302 Raj Kumar. Use of organic reagents in analytical chemistry. Delhi, Chemistry, 1962-67. Jain, B. D., Professor.

Dihydroxycoumarins, especially ortho-dihydroxy and peri-dihydroxycoumarins have been studied for their analytical applications.

547.301

1008.303 Ramachandra Reddy, Gorantla. Organic reagents in the analysis of cobalt, zinc, uranium, tin, antimony and titanium. Venkateswara, Chemistry, 1959-67. Neelakantam, Kalla, Professor and Head of the Department.

Several fluorescent indicators have been suggested for the volumetric estimation of antimony under ultraviolet light. A modified procedure for the estimation of cobalt by 2,4-dinitroso resorcinol has also been suggested. Polarographic method for the estimation of uranium by resacetophenoneoxime is being studied.

547.301

1009.304 Sanyal, Gaurisankar. Physico-chemical studies of organic reagents used in inorganic analysis. Calcutta, Chemistry, 1964-67. Datta, Nihar Kumar, Professor, Indian Association for Cultivation of Science, Calcutta.

547.301

1010.305 Seshadri, T. Physico-chemical studies on organic reagents used in inorganic analysis and their analytical applications. Calcutta, Chemistry, 1963-67. Datta, Niharkumar, Professor, Indian Association for Cultivation of Science, Calcutta.

547.301

1011.306 Varughese, Kurian. Thiformanilide : A new reagent for qualitative and quantitative analysis. Vikram, Holkar Science College, Indore, 1966-70. Deshpande, S. S., Professor Emeritus, Holkar Science College, Indore.

547.301

Qualitative Analysis

1012.307 Deshpande, Prabhakar Gangadhar. Electrodeposition of aluminium and aluminium alloys with special emphasis on dispersion hardening. Poona, Atomic Energy Establishment, Trombay, 1964-67. Jagdish Shankar, Head, Chemistry Division, Atomic Energy Establishment, Trombay.

Electrodeposition of aluminium-alumina from a non-aqueous organic bath is being studied with special emphasis on the dispersion strengthening of aluminium electrodeposits by a submicron grade aluminium oxide, its corrosion resistance in reactor coolants and mechanical properties at elevated temperatures.

547.34

1013.308 Kartha, V. B. Vibrational spectra of molecules in crystalline state and solid matrices. Bombay, Atomic Energy Establishment, Tromby, 1963-66. Jagdish Shankar, Head, Chemistry Division, Atomic Energy Establishment, Trombay.

Infrared spectra of borazine, dihalogeno methanes and phosphine, arsine and stibine has been obtained at 90°K and a revised assignment of the fundamentals of borazine made. The data gives indications of the crystal structure for this molecule and the methylene halides. Vibrational assignments of the isotopic species in solid have also been obtained for the last three molecules.

547.3463

Chromatographic Analysis.

1014.309 Bhagwan Das. Hysteresis in the sorption of water and organic liquids on unhardened proteins and proteins hardened by different cross linking agents. B.I.T.S., Pilani, Chemistry, 1965-68. Subbarao, Kittur, Research Professor.

The adsorption and desorption of water on samples of oxoid and difco gelatin have been studied. The hysteresis effect is found to persist in both the samples upto 10th and 9th cycles respectively whereas the earlier studies on gold seal gelatin had shown the disappearance of hysteresis effect. The gelatin samples have also been hardened with different cross linking agents to study the effect of hardening on hysteresis. The adsorption-desorption of egg albumin and casein are being studied to explore the nature of the hysteresis effect.

547.3492

1015.310 Bhatia, Ravindra Kumar Singh. Studies in adsorption-desorption hysteresis of water on mica and cellophane. B.I.T.S., Pilani, Chemistry, 1966-69. Subbarao, Kittur, Research Professor.

Adsorption and desorption of water on mica and cellophane have been studied with the help of Quartz Fibre Spring Technique. In the case of cellophane, unwashed with water, there is no hysteresis loop and adsorption and desorption isotherms are coincident, whereas in cellophane, washed with water, there is the the hysteresis loop in the first cycle and it disappears in second and third cycle. In the case of mica, there is no hysteresis.

547.3492

1016.311 Bhatt, Ramprasad Ambalal. Ion exchange and related studies. Baroda, Chemistry, 1965-67. Bafna, S. L., Reader.

A study of the ion exchange with salts of various types has been completed. Sorption studies with ion exchange materials of organic compounds, such as, coumarin and carboxylic acids are being carried out to obtain conditions for separation of mixtures.

Jour. Ind. Chem. Soc. 42; 1965: p.589.

547.34923

1017.312 Saxena, Roop Chandra. Physico-chemical studies on the role of adsorption and complex formation during the interaction of organic compounds with inorganic gelatins. Roorkee, Chemistry, 1964-67. Malik, Wahid-uddin, Professor and Head of the Department.

Physico-chemical studies on the role of adsorption and complex formation during the interaction of organic compounds with inorganic gels are being carried out to elucidate the structure and preparation of new anils.

547.34922

1018.313 Shah, Rasik Shankerlal. Some studies with ion exchange materials. Baroda, Chemistry, 1963-66. Bafna, S. L., Reader.

Some sorption and equilibria studies of major cinchona alkaloid sulphates with cation exchange resins have been done. Column sorption of some substituted coumarins with anion exchange resin and separation of binary and ternary mixtures of coumarins have also been done.

(1) Ind. Jour. Chem. 1 ; 1963 : p. 400 ; (2) Ibid. 3 ; 1965 : p. 251 ; and (3) Jour. Ind. Chem. Soc. 42 ; 1965 : p. 180, 589.

547.34923

1019.314 Upadhyay, Saurindra Nath. The interaction of proteins and nucleic acids on interface and in solution. Jadavpur, Physical Chemistry, 1965-67. Chattoraj, D. K., Lecturer.

Adsorption of native D. N. A. on alumina surface at different pH and ionic strength has been measured and it is found that there is little effect of ionic strength on adsorption, and the plot of adsorption maxima against pH shows a minimum in the pH 6.5. Compared with native D. N. A., denatured D. N. A. is absorbed ten times on alumina.

547.3492

Quantitative Analysis

Electroanalysis

1020.315 Banerjee, Surath Kumar. Electrochemical studies in glycol water mixtures. Jadavpur, Physical Chemistry, 1962-66. Das, M. N., Reader.

The standard potentials of silver-silver bromide electrode in glycol water mixtures have been determined at five temperatures and the related thermodynamic quantities evaluated. The autoprotolysis constants of media and the dissociation constants the of three acids —acetic, biphthalate ion and monoethanolammonium ion--in the media have been worked out at five temperatures. The thermodynamic quantities associated with these ionisation processes have also been evaluated.

547.353

1021.316 Chatterjee, Malay Kumar. Organic A. C. polarography in aqueous and non-aqueous media. B. I. T. S., Pilani, Chemistry, 1962-67. Gupta, S. L., Professor and Head of the Department.

Effect of various physical factors on the reaction peaks observd with organic nitro compounds at the d. m. e. in aqueous and non-aqueous media has been studied by A. C. polarography. Structural studies of the organic nitro compounds in different media and comparative studies of the mixtures of organic reduction and tensammetric compounds have been undertaken. Applications of A. C. polarography to the studies of complex metal ions will be explored.

547.3532

1022.317 Chatterjee, Profulla Kumar. Proton transfer equilibria in non-aqueous media. Jadavpur, Physical Chemistry, 1964-67. Das, M. N., Reader and Kundu, K. K., Lecturer.

$E^\circ_{Ag-AgBr}$ and autoprotolysis constant of ethylene glycol have been determined at different temperatures.

Acid dissociation constants of substituted ammonium ions in ethylene glycol have also been calculated at different temperatures. Thermodynamic quantities associated with them are being evaluated.

547.353

1023.318 Gurjar, V. G. Studies in electro-organic chemical processes. I. I. T., Bombay, Chemical Engineering, 1965-68. Kamath, N. R., Professor and Head of the Department.

The work has been undertaken to produce 1, 2 diols by the reduction of carbonyl compounds, like aldehydes and ketones. The main aim is to produce an organic solvent having hydroxyl group on the adjacent carbon atoms which should be immiscible with water.

547.353

1024.319 Hakeem, M.A. Studies on membranes and metal insoluble electrodes. Roorkee, Chemistry, 1966-68. Malik, Wahid-uddin, Professor and Head of the Department.

The membrane electrodes prepared from inorganic compounds including complexes have been studied in detail. Among the metal insoluble electrodes, the metal ferrocyanogen ones have been taken up for study.

547.353

1025.320 Krishna Iyer, S. Venkita. Electrocapilarity. Kerala, Central Electrochemical Research Institute, Karaikudi, 1964-67. Devanathan, M. A. V., Scientist, Central Electrochemical Research Institute, Karaikudi.

Adsorption of a few organic compounds, like formaldehyde, formamide, benzene and cyclohexane at the mercury solution interface has been studied with capillary electrometer. It is proposed to study the adsorption of naphthalene and decalin also.

547.353

1026.321 Kulkarni, Nagesh Raghunath. Polarography. Banaras, Chemistry, 1965-66. Deshmukh, G. S., Reader.

Amidino thiourea has been used as a qualitative reagent. It is now being explored for application in quantitative estimations using appropriate buffers.

547.3532

1027.322 Nandi, Ram Krishna. Analytical chemistry and polarography. Banaras, Chemistry, 1965-67. Deshmukh, G. S., Reader.

Polarographic behaviour of the organic compound MDTB has been studied. It is found to yield a well defined anodic wave being oxidised at the electrode surface over a wide span of pH and potential range in various electrolytes. This anodic wave has been utilised in the direct amperometric titration of a number of metal ions and simultaneous determination of their binary mixtures.

Ind. Jour. Chem. 4 ; 1966 : p. 414-415.

547.3532

1028.323 Rakshit, Animesh. Determination of standard potentials of some metal-metal ion electrodes in ethylene glycol. Jadavpur, Physical Chemistry, 1966-69. Kundu, K. K., Lecturer.

Studies have been undertaken to determine the standard potentials of some M/M^{+n} electrodes in glycolic solvents with the help of a cell of the type Hg(M)y (M x in ethylene glycol) Ag x Ag, and to evaluate the medium effects on the thermodynamic properties as well as the related energetics of ion solvent interactions.

547.35312

1029.324 Sharma, Badri Nath. Analytical chemistry. Banaras, Chemistry, 1965-67. Deshmukh, G. S., Reader.

The use of mercapto succinic acid and mercaptobenzoic acid as precipitating reagents for a number of cations is being investigated. A comparative study of the polarographic characteristics of these two thio compounds and the corresponding ions is in progress to determine the possibility of employing those thio acids as titrants in the amperometric titrations of certain cations under well-established experimental conditions.

547.3532

Micro & Semimicro Methods

1030.325 Kidwai, Mohd. Asim. Studies in micro and semimicro techniques for the estimation of active ingredients in plants. Aligarh, Chemistry, 1966-69. Osman, S. M., Reader, and Gupta, K.C., Indian Agricultural Research Institute, New Delhi.

547.3584

Aliphatic Compounds

Hydrocarbons & Their Derivatives

1031.326 Beg, Mirza Zafrul Hasan. Hypercole terolemic effect of C_2hydroxy-3-methylglutaric acid. Aligarh, Chemistry, 1966-69. n.g.

547.437

1032.327 Gelra, Mahaveer Raj. Studies on reaction of aliphatic ketones with iodine and some tertiary bases. Jodhpur, Chemistry, 1966-69. Sexana, J. P., Reader.

Perhalides of various heterocyclic N-bases and various quaternary salts e.g. Acetonyl pyridinium iodide, Acetonyl quinolinium iodide etc., have been prepared with iodine, heterocyclic base and aliphatic ketones, and the reactions involved are under study.

547.436

1033.328 Gupta, Asim. Studies on fatty acid monoglycerides and their sulphates. Calcutta, Chemistry, 1963-67. Mukherjee, R. N., Reader in Chemistry, Jadavpur University.

547.431

1034.329 Gurumurthy, R. d-Orbital resonance of chlorine, bromine and iodine in some organic compounds. Annamalai, Chemistry, 1963-68. Baliah. V., Professor and Head of the Department.

Halosubstituted phenoxyacetic, mercaptoacetic and sulphonyl acetic acids and their esters have been prepared to study the rates of esterification and ester hydrolysis.

547.437

1035.330 Kavimandan, Vasu Deo. Catalytic oxidation of paraffins. Banaras, Chemistry, 1965-67. S. Prasad, Reader.

Experiments on oxidation of paraffin wax (m.p. 62°C) have been conducted to produce higher fatty acids. Oxidation catalysts, e.g. V_2O_5, HNO_3 vapours, $KMnO_4$, Na-stearate, Mn-stearate and Na-meta vanadate, when employed in the temperature range of 120°-170°C, give 25-53% mixed fatty acids. The wax acids, thus produced, yield good soap with alkali. Oxidation of n-hexane has also been performed in the presence of stainless steel, V_2O_5. SiO_2 and glass surface at 275°-500°C and a product of maximum acid value (193.0 mg. KOH/ml of oxidation product) obtained.

547.411

1036.331 Krishan Lal. Physico-chemical studies on the degradation of polyethylene in solutions. Kurukshetra, Chemistry, 1963-66. Bhatnagar, Hari L., Regional Engg. College, Kurukshetra.

The kinetics of degradation of polyethylene in various solvents have been studied to determine the energy of activation for degradation as also the mode of degradation. Analysis of the data shows that polyethylene molecule follows 'Random Scission' mechanism. The energies of activation for degradation in different solvents indicate that the chain scission has taken place at 'weak links'.

547.412

1037.332 Mathur, Narinder Sahai. Possible antitubercular compounds: Disubstituted acetic acids. Bombay, Parle College, Bombay, 1964-67. Nargund, K. S., Professor, Parle College, Bombay.

Mandelic acid, p-chloromandelic acid and p-methylmandelic acid have been condensed with various phenols to obtain disubstituted acetic acids. A few of these acids have been resolved into dextro and laevo isomers. Glycine conjugates and the condensation of aldehydes with the hydrizides of some of these acids have been made. Aryl or alkyl quinolylmethyl acetic acids and aryl or alkyl thiazolylmethyl acetic acids have also been prepared.

547.437

1038.333 Natrajan, R. K. Rearrangement of some bicyclic δ-hydroxy-α, β-enones. Madras, Organic Chemistry, 1961-66. Swaminathan, Sambasivan, Professor.

Rearrangement of some bicyclic δ-hydroxy-α, β-enones with p-toluene sulphonic acid has been studied. Structures have been assigned on the basis of spectroscopic evidence and the products identified by synthesis. The studies are extended to the related hydroxy enones.

Jour. Org. Chem. 31 ; 1966 : p. 656.

547.437

1039.334 Pal, Birendrakumar. Synthetic investigation of possible hypoglycerin agents. Calcutta, Chemistry, 1964-67. Basu, U.P., Director, Bengal Immunity Research Centre, Calcutta.

547.431

1040.335 Patel, Sanandbhai Bhailalbhai. Studies on arylamides of acetoacetic acid. Patel, Chemistry, 1963-66. Mankad, B. N., Reader.

Several α-oximinoacetoacetarylamides have been interacted with ammonia, alkylamines and aralkylamines, and corresponding β-imino derivatives have been obtained. Their configuration, enamine-imine tautomerism, phototropism and chelating ability have been studied and configuration of Pd-chelates has been established. Dioximes and β-imino α-oximino compounds have been cyclized to 1 : 2 : 5-oxadiazoles and $\triangle^2$—1 : 2 : 5-oxadiazolines respectively. Ultraviolet and infrared spectra of imino derivatives and cyclized products has also been studied.

547.442

1041.336 Ravindranathan, Marayil. Studies in reaction of γ-keto acids and their derivatives. I. I. S., Bangalore, Organic

Chemistry, 1966-69. Bhatt, Mangalore Vivekanand, Assoc. Professor.

547.436

1042.337 Sawarkar, Nilkanth Janbaji. Autoxidation of oils and fats. Poona, Agricultural Chemistry, 1963-67. Narayana, N., Professor.

It is proposed to study the autoxidation of edible oils i.e. safflower, groundnut, til, coconut, castor and vanaspati at the temperature of boiling water, as also the mechanism involved therein.

547.43

1043.338 Vittal Rao, Annigere Seshagiri Rao. The reactions of organo-boranes. I. I. S., Bangalore, Organic Chemistry, 1961-67. Bhatt, Mangalore Vivekanand, Assoc. Professor.

The research comprises the study and synthetic applications of organo-boranes derived from (1) 1, 1-diphenyl ethylenes and their isomerization, (2) The enol-acetates of various ketones, (3) The enol-ethers of various ketones, and (4) The vinyl chloro compounds derived from various ketones.

547.436

Metallic Compounds

1044.339 Leelamani, Esapathi Govindarajulu. Carbonyl and hydrido carbonyl complexes of transition metals. Bangalore, Chemistry, 1965-68. Narayana Reddy, Gidnahalli Karagappa, Lecturer.

$RhBr(CO)(Ph_3P)_2$ and $RhBr(CO)[(p\text{-}CH_3C_6H_4)_3P]$ have been prepared by reflexing rhodium bromide with excess of the phosphine in methoxy ethanol. $RhBr(CO)(Ph_3P)_2$ reacts with Br_2, I_2 and HBr to give $(Ph_3P)_2Rh(CO)Br_3$, $(Ph_3P)_2Rh(CO)BrI_2$ and $(Ph_3P)_2Rh(CO)HBr_2$ respectively.

Triphenyl phosphine, carbonyl and bromo complexes of rhodium. Curr. Sci. 1965 : p. 146-147.

547.45

1045.340 Sharma, Chokhe Lal. Physico-chemical studies of some new heavy metal imides. Roorkee, Chemistry, 1964-67. Malik, Wahid-uddin, Professor and Head of the Department.

A comprehensive study on the interaction of metals of physiological importance with imides and other related compounds has been carried out to determine the real nature of the compounds associated with the animal system and the mechanism involved therein. Metal ions used are iron, copper, nickel, cobalt, palladium and cerium, while succinimide, 3 nitrophethalimide, saccharin, benzofur 2 yl carboxomide M-ptolune sulphonyl and pyrid 2 yl carboxomide N-ptolune sulphonyl have been used as complexing agents. Synthesis of some other new sulfonamides has also been undertaken.

547.45

Alicyclic Compounds

1046.341 Biswas, Kalyankumar. Synthetic studies in polycyclic systems. Calcutta, Pure Chemistry, 1965-67. Nasipuri, D., Reader.

547.5

1047.342 Chacko, Anthony Pullan. Synthesis of alicyclic compounds related to diterpenoids and related alkaloids. Calcutta, Chemistry, 1964-67. Dasgupta, S. K., Reader in Chemistry, Jadavpur University.

547.5

1048.343 Chakrabarti, Jyotirmay. Synthetic studies in condensed cyclic systems. Calcutta, Chemistry, 1962-67. Ghatak, R. R., Reader, Indian Association for Cultivation of Science, Calcutta.

547.5

Hydrocarbons

1049.344 Gangopadhyay, Abhayanath. Studies in alicyclic systems. Calcutta, Organic Chemistry, 1963-67. Mukherjee, P. C., Professor of Chemistry, Presidency College, Calcutta.

547.51

1050.345 Shafiullah. Alicyclic chemistry with special reference to steroids. Aligarh, Chemistry, 1966-69. M. S. Ahmad, Reader.

547.51

1051.346 Siddiqi, Mohd. Abdul Hameed. Chemical studies in alicyclic systems. Aligarh, Chemistry, 1965-68. Shahabuddin Ahmad.

547.51

Aldehydes & Ketones

1052.347 Chowdhri, Bhanwar Lal. Study of some homocyclic polyketones. Jiwaji, Chemistry, 1965-67. Haksar, C. N., Officer-in-charge, Jiwaji Research Laboratory, Gwalior.

Some homocyclic polyketones derived from cyclobutane, cyclopentane and cyclohexane have been synthesised by condensing β - ketoesters with esters of dibasic acids. It is proposed to study their comparative stabilities with respect to carbonyl groups forming constituent parts of their side chains which will affect the strain on these rings.

547.536

Acids

1053.348 Jadhav, Prabhakar Mahadev. Chemistry of β substituted glutaconic and glutaric acids and anhydrides. Bombay, S. I. E. S. College, Bombay, 1964-68. Gogate, G. R., Principal and Professor of Chemistry, S. I. E. S. College, Bombay.

Anhydrous aluminium chloride when reacted with ββ di (p methoxy phenyl) glutaric anhydride in nitrobenzene solution and benzene in the presence of a little anisole resulted in the formation of ββ di (p methoxy phenyl) ethylene by a loss of Co_2 and acetic acid. In a new type of condensation of anisole with acetone-dicarboxylic acid, a dicarboxylic acid containing substituted cyclopropane ring has been isolated.

547.537

1054.349 Kulshreshtha, Ravindra. A study on anhydrosalts. Jodhpur Chemistry, 1963-66. Saxena, J. P., Reader.

Ylids have been classified under the head anhydrosalts. They have wide synthetic applications. The hydrocarbon, fluorene, forms ylids with heterocyclic bases. Twelve fluorenylids have been prepared. They give intense blue colour in chloroform which fades to yellow on keeping for some time. This is found to be due to the autoxidation. The mechanism of autoxidation has been investigated. Ylids can be stabilised by introducing appropriate substituents.

547.537

1055.350 Vaikuntam, I. L. Studies on extraction of heteropoly acid into organic solvents. Bombay, Institute of Science, 1964-67. Haldar, B. C., Professor of Inorganic Chemistry.

The extraction of heteropoly acids—phosphomolybdic, silicomolybdic and phosphotungstic acids—into organic solvents has been carried out under wide range of experimental conditions. The solvents selected include hydrocarbons, halogenated hydrocarbons, alcohols, esters, ketones etc. Extraction studies have also been made with TBP in different diluents, such as, benzene, nitrobenzene and methyl ethyl ketones.

547.537

Metallic Compounds

1056.351 Kishan Lal. A physico-chemical study of normal and mixed ligand chelates of oxovanadium (iv) with some oxygen and nitrogen donor ligands. Roorkee, Chemistry, 1964-67. Agarwal, R. P., Lecturer.

It is proposed to study mixed ligand chelates of VO (iv) with o-phen and some dihydric phenolic compounds, o-phen and some carboxylic acids, dipyridyl and some carboxylic acids, and bidentate oxygen donor ligands; equilibria of interaction of VO (iv) with catechol, tartaric and malic acids, and mandelic and lactic acids ; interaction of VO (iv) with iminodiacetic acid; composition and stability of chromotropic acid with VO (iv) ; and the stability of chromium chelates of 8-quinolinol-5-sulphonate.

Jour. Ind. Chem. Soc. 43(3) ; 1966.

547.55

1057.352 Verma, Sudarshan Kumar. Chelates of uranium (VI) with oxygen donor ligands and a study of their stability and polymerization. Roorkee, Chemistry, 1964-67. Agarwal, R. P., Lecturer.

A detailed study of the following is envisaged : (i) Preparation of Mn(iii) pyrophosphate and its interaction with potassium ferrocyanide, (ii) Interaction of Cu^{2+} with O-hydroxy-naphthoic acid in 50% alcoholic medium, (iii) Stability and polymerization of uranyl-mandelate chelates, (iv) Physico-chemical studies of the interaction of uranyl ion with malonic acid, (v) Interaction of UO^{2+} with o-hydroxy-naphthoic acid in 50% alcoholic medium, (vi) Interaction of UO^{2+} with salicylic and its derivates in 50% alcoholic medium, and (vii) Stability and polymerization of uranyl-catechol chelates.

Jour. Less Com. Met. 12(3) ; 1967 : p. 221-230.

547.55

Silicon Compounds

1058.353 Kenkare, Vinayak Sakharam. Chemistry of homo-phthalic acids and their anhydrides. Bombay, S.I.E.S. College, Bombay, 1964-67. Gogate, G.R., Principal and Professor of Chemistry, S.I.E.S. College, Bombay.

C acylation of homo-phthalic anhydrides has been successfully carried out and the reactions of the C acyl derivatives have been investigated. As a result of this, a general method for introducing any group in the '3' position of iso-coumarins has been developed. Homophthalic anils and imides have been shown to couple with several diazotised bases to produce a variety of azo-dyes.

547.584

Heterocyclic Compounds

1059.354 Ashok Kumar Singh. Studies on some heterocyclic compounds with potential anti-bacterial properties. Banaras, Chemistry, 1966-68. Deshpande, S.M., Reader.

The derivatives of ethylene diamine, tri-, tetra-, penta- and hexamethylene diamine are being synthesised with pyridine, quinoline and acridine nuclei, in different combinations, on end nitrogen atoms. These will help prepare anti-bacterial drugs acting against T.B. and Leprosy.

547.59

1060.355 Chaudhuri, Bijaykrishna. Studies on naturally occuring heterocyclic compounds. Calcutta, Chemistry, 1964-67. Chakarbarti, D.P., Reader in Chemistry, Bose Institute, Calcutta.

547.59

1061.356 De, Gauri Sankar. Kinetics and mechanism of substitution reactions of octahedral complexes. Burdwan, Chemistry, 1966-68. Siddhanta, Sushil Kumar, Professor and Head of the Department.

The velocity of reaction between cis- and trans $Coen_2cl_2cl$ and o-phenanthroline has been studied from the effect of ionic strength on the specific rate. The nature of activated species has been ascertained and the activation energy and the entropy of activation has been determined from temperature coefficient of the reaction rate. Reaction between o-phenanthroline and other disubstituted bis ethylene diamine cobalt(III) complexes will also be studied.

547.59

1062.357 Jesthi, Pradipta Kumar. Studies on heterocyclic compounds with special reference to pyran derivatives and sulphur compounds. Utkal. Chemistry, 1963-66. Rout, Mahendra Kumar, Professor and Head of the Department.

Merocyanines and paradialkylaminostyryl dyes have been derived from benzo (f) quinoline, 6, bromo-4-hydroxy coumarine and 4,5-diarylthiazoles. The absorption data of these compounds have been utilised for structure spectra correlation. The photographic sensitising properties of some of these dyes have been evaluated. Some anti-spasmodics have also been derived from various heterocyclic nuclei. Some of them are being screened for their anti-spasmodic and anti-histaminic properties.

547.59

1063.358 Muhamad Kutty, Kizhakkay Idathil. Synthesis of heterocycles. Kerala, Chemistry, 1965-69. Eapen, Kalathil Chandy, Lecturer.

It is proposed to synthesise benzoxazines with potential antitumour activity starting from mono and bifunctional methylene bis-phenols.

547.59

1064.359 Mukhopadhyay, Samarendra. Synthesis of heterocyclic compounds as possible chemotherapeutic agents. Calcutta, Applied Chemistry, 1963-67. Pathak, B., Reader.

547.59

1065.360 Nair, Kanakalakshmi B. Studies in heterocyclic compounds. Baroda, Chemistry, 1963-66. Sethna, Suresh, Professor.

The chloromethylation of some biphenyl derivatives has been studied. The chloromethyl derivatives have been converted into the corresponding formyl derivatives and the formyl derivatives have been converted into the biflavonyl derivatives. Friedel-Crafts acetylation of some of the biphenyl derivatives is being studied.

547.59

1066.361 Narasimhan, K. Studies in heterocyclic chemistry. Madras, Organic Chemistry, 1961-66. Swaminathan, S., Professor.

It is proposed to study the synthesis of 1-acetyl-2-(2'-indolyl methyl)-carbazate—an analogue of ethyl acetyl N tryptophane ; preparation of N-isogramine and related N-Mannich bases of indole; reactions of N-isogramine and study of its rearrangement to gramine under various conditions; and synthesis of N-isotryptophane via ethyl α-cyano, -α- acetamedo -(N-indolinyl) propionate.

(1) Ind. Jour. Chem. 2;1964 : p.423; and (2) Chem. Ber. 99 ; 1966 : p.889.

547.59

1067.362 Ramalinga Reddy, Karnaty. Studies on hypotensive drugs. Banaras, Chemistry, 1965-67. Deshpande, S.M., Reader.

Synthesis of two types of heterocyclic derivatives possessing possible hypotensive activity is in progress. One of them is the synthesis of 4-pyridyl acetic acid esters, in which some final compounds have already been prepared. The other is the synthesis of quinolizine derivatives which is still in progress.

547.59

1068.363 Roy, Jharna. Studies on polycyclic compounds. Jadavpur, Organic Chemistry, 1966-68. Ghosh, Nikhil Ranjan, Reader.

547.59

1069.364 Saxena, Mahendra Pratap. Synthesis of heterocyclic compounds. Aligarh, Chemistry, 1966-69. S. R. Ahmad.

547.59

1070.365 Sen Gupta, Prabal. Studies on Indian medicinal plants and synthesis of heterocyclic compounds. I.I.T., Kharagpur, Chemistry, 1966-69. Sen, A. K., Asstt. Professor.

A large number of indigenous plants have been widely recognised in Ayurvedic medicine. Work has been undertaken for isolation and characterization of their effective constituents. Heterocyclic compounds as possible medicinal agents are also being synthesised.

547.59

1071.366 Srinivasan, Asur. Heterocyclic compounds. I. I. S., Bangalore, Organic Chemistry, 1962-67. Kasturi, Tirumalai Rangachar, Lecturer.

A revised structure for the condensation product of 2-carbethoxycyclopentanone and ethyl cyanoacetate has been proposed. Various types of dicyano esters and tricyano compounds have been prepared to study their anomalous ultraviolet spectra. A tricyclic intermediate for the total synthesis of 6-oxa-steroids is under preparation.

Tetrahedron. 22 ; 1966 : p. 2575-2580.

547.59

1072.367 Subhadra Kumari, Satuluru. Synthesis of some physiologically active heterocyclic compounds containing oxygen and nitrogen. Osmania, Chemistry, 1965-68. Subba Rao, Nanduri Venkata, Professor and Head of the Department.

It is proposed to synthesise some condensed chromono-oxazoles 7, 8 (angular) and 6, 7 (linear) and some chromono-isoxazole 7, 8 and to test their physiological activity.

547.59

1073.368 Vohra, Bhagirath Nath. A new stereospecific synthesis of meroquinene. Banaras, Chemistry, 1966-68. G. B. Singh, Professor and Head of the Department.

A new stereospecific synthesis of *meroquinene*, a key intermediate in the synthesis of quinine, has been accomplished. The piperidine nucleus has been built by Dieckman cyclization of N-bis (β-carbmethoxyethyl)-benzyl amine. β-dimethyl aminoethyl group has been introduced to have vinyl function in the final product. Acelic acid residue has also been introduced using a phosphonate carbanion.

547.59

Oxy Derivatives

1074.369 Agasimundin, Y. S. Furanobenzopyrones. Karnatak, Chemistry, 1963-66. Rajagopal, S., Reader.

A large number of linear and angular furanoxanthones have been synthesised to study their possible photodynamic activity.

547.592

1075.370 Chudgar, Navinchandra Kasturchand. Studies in isoflavones. Baroda, Chemistry, 1963-66. Sethna, Suresh, Professor.

The bromination of 7-hydroxy and 6-hydroxy isoflavone has been studied. Mannich bases have been prepared from a number of isoflavones. Friedel-Crafts and Fries reactions have been carried out on 7-hydroxy and 6-hydroxy isoflavone.

547.592

1076.371 Goswami, Das Digamberrao. Studies in oxygen heterocyclic compounds. Marathwada, Chemistry, 1963-66. Thakar, Kamalakar Anant, Reader.

It is proposed to study the synthesis of 6-halogenosalicylaldehydes and 2-halogeno-4-hydroxy benzaldehydes from m-halogeno phenols, 5-halogenocoumarins and their 3-substituted derivatives from 6-halogeno salicylaldehydes, and halogeno-hydroxy chalkones from 0-hydroxy acetophenone, 4-halogeno-2-hydroxy acetophenones, 6-halogeno-salicylaldehydes and 2-halogeno-4-hydroxy benzaldehydes.

547.592

1077.372 Jagwani, Uttam Kundandas. Studies in flavones and flavanones. Baroda, Chemistry, 1960-66. Sethna, Suresh, Professor.

The iodination of several flavones and flavanones has been studied and the mono iodo derivatives have been subjected to Rosenmund reaction to get the corresponding cyano derivatives and to Ullamann reaction to get the biflavonyl derivatives. Chloromethylation of several flavones has also been studied.

Jour. Ind. Chem. Soc. 42 ; 1965 : p.435-438.

547.592

1078.373 Kamat, Madhav Shridhar. Studies in flavans. Bombay, Institute of Science, 1964-68. Kulkarni, A. B., Professor and Head of the Department of Chemistry.

The normal methods developed for the synthesis of leucoanthocyanidins are not applicable to the synthesis of 5-substituted leucoanthocyanidins. So it is proposed to use 5-substituted catechins as intermediates for the synthesis of 5-substituted flavan-3, 4-diols. Thus work has been undertaken to introduce C4-OH in 6-methyl-4′-methoxy catechin either through oxidation or halogenation and replacement of the halogen atom by a hydroxy group. This method will then be extended to 5-substituted catechins.

547.592

1079.374 Kela, Rajendra Kishore. Studies in some oxygen heterocyclic compounds of pharmacological interest. Roorkee, Chemistry, 1966-69. Mahesh, V. K., Lecturer.

It is proposed to synthesise the physiologically potent oriseofulvin analogues and other oxygen heterocyclics of spirocyclic carbon skeleton.

547.592

1080.375 Mani, N. V. Studies in isoflavones. Baroda, Chemistry, 1963-66. Sethna, Suresh, Professor.

Nitration of simple 7-hydroxy and 6-hydroxy isoflavone has been studied and the structures of the products are being established.

547.592

1081.376 Naik, Gunvantrai Nichhabhai. Studies in benzo-γ-pyrones and diketones. Baroda, Chemistry, 1963-66. Sethna, Suresh, Professor.

The bromination of some flavones has been studied and the structures of the bromo derivatives established. N.M.R. studies of bromoflavones have also been made to establish the structures of the flavones brominated in 3-position.

(1) Jour. Sci. Ind. Res. 20B ; 1961 : p. 339 ; and (2) Ind. Jour. Chem. 4 ; 1966 : p. 273.

547.592

1082.377 Ramchandra Moorty, Sistla. Synthesis of oxygen heterocyclic compounds for physiological activity. Osmania, Chemistry, 1963-67. Sundaramurthy, Veturi, Reader.

The anticoagulant activity of dicoummaral paved way for the search of newer synthetic substitutes which can more effectively fight thrombosis. Of the compounds prepared, a mention may be made of cyclocoummarol, phenindione and warfarin. Certain halohydroxy substituted indan-1, 3-diones have been synthesised by the direct condensation of the phenyl acetates and malonyl chloride in the presence of anhydrous $AlCl_3$ and nitrobenzene or carbon disulphide as solvent. In another experiment five membered ring systems, like isoxazoles, pyrazoles and iminazoles are, being built up involving the 3 and 4 positions of the coumarin ring. In addition, some indigenous medicinal plants are also under investigation.

547.592

1083.378 Salvi, Vilas Shivram. Studies in benzofuran derivatives. Baroda, Chemistry, 1963-65. Sethna, Suresh, Professor.

The bromination of various benzofurans has been studied and the structures of the products obtained established. Some bromobenzofurans have been synthesised from bromophenolic ketones. The Friedel-Crafts acylation and Fries migration on some benzofurans have been studied. α-and β-pyrone rings have also been built up on some hydroxybenzofurans.

547.592

1084.379 Vijayalakshmi, Mysore. Synthesis of some oxygen heterocyclic compounds as potential insecticides. Osmania, Chemistry, 1965-68. Subba Rao, Nanduri Venkata, Professor and Head of the Department.

Flavones and isoflavones have been found to be toxic to fish although none of the synthetic compounds are as active as Rotenone. Among flavones, 7 : 3 : 4 trimethoxy-3-methyl flavone has been found to be highly toxic to fish. Since the presence of a halo or an amino group in 7 position of the above compounds is reported to enhance the activity of the molecule, a systematic study has been undertaken to synthesise various 7-amino and halo substituted 3-alkyl flavones. A number of isoflavones have also been reported to be highly toxic to fish. Since isoflavones and 3-aryl 4-hydroxy coumarins seem to have a common biogenetic precursor, the latter compounds may also be toxic to fish. The synthesis of 4-hydroxy coumarins is in progress with a view to test their toxicity.

547.592

1085.380 Wadodkar, Prabhakar Narayan. Synthesis of benzopyrones. Nagpur, Vidarbha Mahavidyalaya, Amravati, 1961-67. Marathey, M. G., Professor and Head of the Department of Chemistry, Vidarbha Mahavidyalaya, Amravati.

Synthesis of substituted flavones has been carried out. Flavones have been synthesised by reaction of pyridine with chalkone dibromides. The study of the kinetics and structure of certain reagents forming complexes with bromine which are utilized in the present work is in progress.

(1) Ind. Jour. Chem. 1 (3) ; 1963 : p. 122-123 ; and (2) ibid. 1 (4) ; 1963 : p. 163-164.

547.592

1086.381 Wahegaonkar, Ambadas Dattatraya. Synthesis in oxygen heterocyclics. Marathwada, Chemistry, 1964-67. Thakar, Kamalakar Anant, Reader.

The work is being carried out in the field of oxygen heterocyclics and is confined to the synthesis of some ethyl substituted coumarins and flavones and furo-flavonoids, which are likely to exhibit physiological activity.

547.592

Nitrogen Derivatives

1087.382 Ambekar, S. Y. Synthetic studies in the indole field. Karnatak, Chemistry, 1963-67. Siddappa, S., Professor and Head of the Department.

Various indole derivatives of biological interest with both halogen and methyl groups in the benzene moiety have been prepared. Linear benzindole derivatives are also being synthesised.

(1) Jour. Karnatak Uni. 9-10 ; 1964-65 : p.5-12 ; and (2) Jour. Chem. Soc. 4 ; 1966 : p. 477-478.

547.593

1088.383 Baldev Singh. Studies on isatins : Their synthesis and biological properties. Panjab, Biochemistry, 1964-67. Sareen, K. N., Professor and Head of the Department.

547.593

1089.384 Basangoudar, L. D. Synthetic studies in the indole field. Karnatak, Chemistry, 1964-68. Siddappa, S., Professor and Head of the Department.

Cyanoethylation of various Bz-substituted indoles has been carried out. These compounds have been used for the synthesis of various indole derivatives of biological interest.

547.593

1090.385 Betkerur, S. N. Synthetic studies in the indole field. Karnatak, Chemistry, 1965-69. Siddappa, S., Professor and Head of the Department.

The general method for the synthesis of 5-hydroxyindole derivatives from quinones has been employed for the synthesis of various N-substituted 2-phenyl-5-hydroxyindole types.

547.593

1091.386 Charubala, R. Studies on nitrogen heterocyclic compounds. Madras, Presidency College, Madras, 1965-68. Pai, B. R., Chief Professor of Chemistry, Presidency College, Madras.

Work on the synthesis of natural nitrogen heterocyclic compounds is in progress.

547.593

1092.387 Daswani, L. V. Chemistry of some derivatives of acridone. Bombay, St. Xavier's College, Bombay, 1961-67. Nadkarni, V. V.

Different methods of preparation of 2-hydroxy acridone have been attempted. Bromination, methylation, acetylation, sulfonation, oxidation and reduction of 2-hydroxy acridone have also been carried out under different conditions.

547.593

1093.388 Devanathan, Vangeepuram Canchi. Studies in heterocyclic compounds. Madurai, Chemistry, 1963-67. Arumugam, N., Reader.

Synthesis of substituted benzo (c) phenanthridines is being attempted. The reduction of a β-keto ester under Clemensen conditions has been studied in detail. The influence of the steric size of the ortho substituent in Pschorr type cyclisation has been investigated. The steriospecificity of lithium aluminium hydride reduction of oximes is in progress.

547.593

1094.389 Gopalakrishnan, P. V. Studies in nitrogen heterocyclics. Madras, Organic Chemistry, 1961-66. Thyagarajan, B. S., Reader.

Aromaticity in 4H-quinolizin-4-one has been established. Structural factors have been found to decide the course of formation of quinolizines and indolizines from the same reactants. Cationoid displacements in tetrahydro-quinolizones in sequential relationship with 2-pyridones and 4-quinolizones are being studied. The kinetics of the formation of symmetrical and unsymmetrical quinolizone-pentacyanopropene salt from dimeric pyridone-pentacyanopropene salt are under study.

(1) Tetrahedron. 20 ; 1964 : p. 1051 ; (2) ibid. 21 ; 1965 : p.945, 3305 ; and (3) Chem. & Ind. 1966 : p.1887.

547.593

1095.390 Kesavan, Vijayaraghavan. Studies in nitrogen heterocyclics. Madurai, Chemistry, 1965-68. Arumugam, N., Reader.

Synthesis of phenanthridinium compounds, the benzophenanthridines, is being attempted. Conformational studies of aryl-nitro-nitroso cyclohexanes by physical and physico-chemical methods are in progress. Investigations of a Pschorr type ring closure with an ortho substituent have been carried out. Steriospecific nature of lithium aluminium hydride reductions is being investigated.

547.593

1096.391 Krishnamoorthy, Sundaram. Studies in heterocyclic compounds. Madurai, Chemistry, 1965-69. Arumugam, N., Reader.

Chemical investigation of some of the Indian medicinal plants is being carried out with particular reference to the isolation of the nitrogenous compounds and other heterocyclics. The plants of 'Labiatae' family are known to have carminative and antispasmodic activities. An aromatic unsaturated acid has been isolated from the plant 'Leucas aspera' and its chemical nature is being studied. A hydroxy acid has also been isolated from the plant 'Anisomeles malabarica'.

547.593

1097.392 Narayanaswamy, S. Studies on nitrogen heterocyclic compounds. Madras, Presidency College, Madras, 1964-67. Pai, B. R , Chief Professor of Chemistry, Presidency College, Madras.

Work on the synthesis of naturally occuring nitrogen heterocyclic compounds is in progress.

547.593

1098.393 Radhakrishnan, T. R. Preparation of some substituted 4-piperidones and 4-piperidinols and a study of their stereochemistry. Annamalai, Chemistry, 1963-68. Balasubramanian, M., Reader.

A number of substituted 4-piperidones and 4-piperidinols have been synthesised. The conformational preference of these compounds is proposed to be studied by the application of physical methods, such as, infrared spectra, NMR spectra and dipole moments.

547.593

1099.394 Rajagopalan, K. Studies in nitrogen heterocyclic compounds. Madras, Organic Chemistry, 1961-66. Thyagarajan, B. S., Reader.

The reaction of N-methyl-2-pyridone with maleic anhydride and tetracyano ethylene has proved it to behave more like an aromatic compound than a diene, because no Diels-Alder addition product could be obtained in either case. Reactions of N-(H), N-alkyl-2-pyridones and 4-H-quinolizin-4-one with various organic acids have been studied. Cyanogen bromide is found to acylate hydroxy acids. A new route to the synthesis of 2(H), 1, 3-benzoxazin-2, 4(3H)-dione has been found. The mechanism of the above reaction is being studied.

(1) Tetrahedron. 19 ; 1963 : p. 1483 ; (2) Tet. Let. 12 ; 1965 : p. 729 ; (3) Chem. & Ind. 1965 : p. 1931 ; and (4) ibid. 1966 : p. 1887.

547.593

1100.395 Ramachandran, V. N. Studies on nitrogen heterocyclic compounds. Madras, Presidency College, Madras, 1965-68. Pai, B. R., Chief Professor of Chemistry, Presidency College, Madras.

Work on the synthesis of naturally occuring nitrogen heterocyclic compounds is in progress.

547.593

1101.396 Sarma, Scion. Synthesis of possible psychopharmacological agents. I. I. T., Kharagpur, Chemistry, 1964-67. Sen, A. K., Asstt. Professor.

A number of indole and isoquinoline derivatives are being prepared as possible psychopharmacological agents. A novel procedure for alkylation of malonic ester has been devised for the preparation of some intermediates necessary for the work in hand.

547.593

1102.397 Sinnur, K. H. Synthesis studies in the indole field. Karnatak, Chemistry, 1965-69. Siddappa, S., Professor and Head of the Department.

Various Bz-substituted 2-phenyl indoles and their derivatives of biological interest have been synthesised.

547.593

1103.398 Srinivasan, R. Studies in nitrogen heterocyclics. Madras, Organic Chemistry, 1966-70. Thyagarajan, B. S., Reader.

Attempts are being made to synthesise non-benzenoid aromatic compounds, containing quinolizone unit. The sequential relationship of 8 : 9 dihydro 4H-quinolizin-4-one with 4H-quinolizin-4-one and 6 : 7 ; 8 : 9 tetrahydro 4H-quinolizin-4-one will be verified. Attempts will also be made to synthesise quinolizones carrying substituents in the non-oxygenated ring.

547.593

1104.399 Vaish, Shiv Prasad. Studies of the recoil effects in cobalt chelates and studies in the preparation of high specific activity Co-60. Bombay, Atomic Energy Establishment, Trombay, 1962-67. Jagdish Shankar, Head, Chemistry Division, Atomic Energy Establishment, Trombay.

Thermal annealing behaviour of neutron irradiated trihydrate, 'hydrated' and anhydrous forms of tris dipyridyl Co(III) perchlorate has been studied in detail. Similar preliminary work on the Co-60 doped and neutron irradiated tris 1, 10, phenanthroline Co(III) perchlorate dihydrate is in progress.

547.593

Sulphur Derivatives

1105.400 Anantapadmanabhan, S. Synthesis of some new heterocyclic compounds containing sulphur as a hetero atom.

Annamalai, Chemistry, 1962-67. Baliah, V., Professor and Head of the Department.

A number of substituted alpha, beta-unsaturated sulphones and benz-1, 4-substituted oxathienes have been synthesised. Ring closure of these alpha, beta-unsaturated sulphones to the corresponding benz-1, 4-oxathienes has been effected. Several substituted oxathiadienes and dithianes and their sulphoxides and sulphones have also been synthesised.

547.594

1106.401 Chaudhry, Hari Singh. Studies on thiazolidones and their derivatives. Kurukshetra, Chemistry, 1965-68. Pujari, H. K., Reader.

The synthesis of thiazolidones has been undertaken to study the biological properties associated with the thiazolidone nucleus. Three series i.e. m-bis-(2-imino-4-thiazolidone-N_2-yl), benzene, p-bis-(2-imino-4-thiazolidone-N_2-yl-)-m, m'-dimethyl-diphenyl and benzimidazo-[1, 2-b]-thiazolodin-4-one have been prepared. These thiazolidones have been condensed with different aldehydes. Bromine derivatives of some of the arglidine thiazolidines have also been prepared.

547.594

1107.402 Chaurasia, Munnu Ram. Studies on heterocyclic sulphur compounds. Banaras, Chemistry, 1966-68. Bhargava, P. N., Reader.

Dissymmetrical thiocarbamides have been synthesised by condensation of different aryl amines with various aryl isothiocyanates. These thiocarbamides are being converted into 3-aryl-2-arylimino-4-thiazolidones.

547.594

1108.403 Chellathurai, T. Synthesis of some sulphur heterocyclics and a study of their conformations. Annamalai, Chemistry, 1963-67. Baliah, V., Professor and Head of the Department.

A number of 2, 6-diarylthiapyranones and their derivatives have been prepared to study the conformations of the isomeric 2, 6-diarylthiapyranones.

547.594

1109.404 Prema, G. Preparation of large ring compounds. Annamalai, Chemistry, 1965-69. Baliah, V., Professor and Head of the Department.

Synthesis of large ring heterocyclic compounds containing sulfur as hetero atom has been undertaken.

547.594

1110.405 Rajalakshmi, C. Preparation of large ring compounds.

Annamalai, Chemistry, 1965-69. Baliah, V., Professor and Head of the Department.

A number of large ring compounds have been synthesised. It is proposed to study their physical properties.

547.594

1111.406 Ramakrishnan, S. Synthesis of some sulphur heterocyclics and a study of their conformations. Annamalai, Chemistry, 1964-68. Baliah, V., Professor and Head of the Department.

Some 1, 4-thiapyranones have been prepared in their cis and trans forms and converted into the corresponding sulphones and sulphoxides. The keto group in all the above compounds has been reduced. The conformations of these thiapyranones, thiapyranols and their sulphoxides and sulphones will be studied by the application of physical methods.

547.594

1112.407 Ram Lakhan. Studies on heterocyclic sulphur compounds. Banaras, Chemistry, 1966-68. Bhargava, P. N., Reader.

2-amino-(substituted) benzothiazoles have been prepared by oxidation of different asymmetrical thioureas with liquid bromine as an inert solvent, and subsequently condensed with aryl isothiocyanate to yield the corresponding thiocarbamides.

547.594

1113.408 Simran Singh. Studies in heterocyclics : Synthesis of thiazolo-quinoxaline, thiazino quinoxalines and thiazolopyrimido quinoxalines. Panjab, Chemistry, 1963-67. Narang, K. S., Professor.

Studies are being done on pyridonaphyridines (tripyridine ring system) in all the possible positions of nitrogen in the three rings. For the synthesis of this system, their precursors i.e. naphyridines (dipyridine) with suitable substitution for their further modification to tripyridines ring systems have been achieved. In addition to this, many derivatives of quinoxalino-benzothiazines and quinoxalino-thiazines have been prepared.

547.594

1114.409 Srivastava, Kripa Shanker Lal. Studies in heterocyclic sulphur compounds. Banaras, Chemistry, 1965-67. Bhargava, P. N., Reader.

3-phenyl-2 : 2^{1}-benzothiazolylimino-4-thiazolidones have been synthesised. Their 5-0-tolueneazo derivatives have been obtained by condensation with 0-toluenediazonium chloride. Experimental evidence has been adduced to support that the azo group is linked at position-5 of thiazolidone nucleus.

547.594

1115.410 Thakker, Rajnikant K. Synthesis of quinazoline sulphonamides. Patel, Chemistry, 1965-68. Patel, S. R., Reader.

Various halogen substituted quinazolone sulphonamides have been synthesised. Their ultraviolet and infrared spectra have been studied. Further work regarding introduction of SO_2NH_2 group in the quinazoline system by replacement reaction is in progress.

547.594

1116.411 Vanajakshi, N. Evaluation of thermodynamic quantities of some organic sulphur compounds. Madras, Pachaiyappa's College, Madras, 1963-67. Shanmuganathan, Sp., Professor and Head of the Department of Chemistry, Pachaiyappa's College, Madras.

Several 4-alkylthioanilines containing substituents in the two and three positions have been prepared and their thermodynamic dissociation constants determined at 30°, 40° and 50° in aqueous dioxane solutions by the e.m.f. method. The thermodynamic quantities $\triangle F^\circ$, $\triangle S^\circ$ and $\triangle H^\circ$ have also been calculated from the dissociation constants. The object of the investigation is to study the steric and polar effects of substituents on the dissociation equilibrium of thioanilines.

547.594

Derivatives with Several Atoms

1117.412 Mukhopadhyay, Minarani. Biochemical studies of simple pyrimidines and their derivatives. Calcutta, Chemistry, 1964-67. Ghosh, S.

547.595

1118.413 Vakula, Tirumala Radha. Studies on the chemistry of 1, 3, 4-oxadiazoles. Osmania, Chemistry, 1963-67. Srinivasan, Vankipuram Ramanuja, Reader.

Many derivatives of 1, 3, 4-oxadiazole are reported to possess anti-inflammatory, anticonvulsant and analgesic properties and are also used as scintillating agents, colour developers etc. However, the chemistry of this ring system does not appear to have been thoroughly studied. Mannich bases of mercapto-oxadiazoles have been prepared to test their activity against bacteria and fungi. A systematic study of the replacement reactions on various 2-substituted-5-methanesulphonyl-1, 3, 4-oxadia-quinazo-; sym-triazolo-, pyro-, and sym-triazino-oxadiazoles has also been undertaken.

Oxidative cyclisation of some 4-benzilthiosemicarbozones. Curr. Sci. 35 ; 1966 : p.483.

547.595

Derivatives with Fused Rings

1119.414 Chudgar, Rasiklal Jamnadas. Studies on quinoline derivatives. Baroda, Chemistry, 1964-66. Trivedi, K. N., Reader.

Several 2-hydroxy-quinoline-4-carboxylic acids have been synthesised by first carrying out the bromination of substituted acetoacetanilides followed by cyclisation, hydrolysis and oxidation. The 4-bromomethyl quinoline derivatives have been used as intermediates for the synthesis of 4-aminomethyl quinoline derivatives. Several quinoline-α-pyrones have also been synthesised.

Bromination of acetoacetanilide : A revision of structure. Curr. Sci. 34 (19) ; 1965 : p.560.

547.596

1120.415 Dattachaudhuri, Sukanta. Synthetic and microbiological studies on compounds related to the nucleic acid bases. Calcutta, Applied Chemistry, 1964-67. Sen, D., Lecturer.

547.596

1121.416 Kannan, R. Studies in homocyclic ring systems. Madras, Organic Chemistry, 1966-70. Swaminathan, S., Professor.

Studies in the synthesis of B. nor, homo and seco aromatic steroids are in progress.

547.596

1122.417 Narayanankutty, Naduvathattil. Quinone studies. I.I.S., Bangalore, Organic Chemistry, 1965-68. Bhatt, Mangalore Vivekanand, Assoc. Professor.

The investigations comprise an attempt to relate the reduction potentials of quinones with structural parametres. Search for new and efficient synthesis of substituted phenanthrene-quinones is in progress and some reactions of quinones will also be studied.

547.596

1123.418 Patel, Bhogilal Motibhai. Studies on the derivatives of acetoacetic acid and heterocycles derived therefrom. Patel, Chemistry, 1965-68. Mankad, B. N., Reader and Patel, S. R., Reader.

2-chloro-4-methyl quinoline derivatives formed on Knorr's synthesis between a suitably substituted aniline and acetoacetic ester and subsequent chlorination with phosphorus oxychloride afforded upon condensation

with various anthronilic acids followed by cyclodehydration have been studied with the corresponding 5-methyl quino (2-lb) quinazol-12-one derivatives. The structure has been proved by studying the ultraviolet and infrared spectra and by its degradative hydrolysis. Further work with other bz-substituted analogues is in progress.
547.596

1124.419 Patel, Dinubhai R. Synthesis of pyranoquinolines and tetracyclic aza-aromatics and study of their spectral properties. Patel, Chemistry, 1964-67. Patel, S. R., Reader.

The starting materials viz., properly substituted 4-hydroxy-3-carbonyl, 8-hydroxy-7-carbonyl and 6-hydroxy-5-carbonyl derivatives of quinoline have been synthesised to effect a synthesis of various pyranoquinolines. Ultraviolet and infrared spectra of these have been studied. Further work regarding building up of the pyran ring on quinoline by the well-known methods is in progress. Variously bz-substituted dibenzo (b, h) (1 : 6) naphyridine ketone-4 have also been synthesised and their spectra and dissociation constants determined.
547.596

Aromatic Compounds

1125.420 Balani, Ram Atmaram. Studies in benzophenone derivatives. Baroda, Chemistry, 1963-65. Sethna, Suresh, Professor.

The chloromethylation of 4-hydroxy and 4-4′-dihydroxy-benzophenone has been studied. The chloromethyl derivatives have been converted into the formyl derivatives and the α- and γ-pyrone rings built up.
547.6

1126.421 Chandrasekharam, Sista Sri. Studies in non-benzenoid aromatic compounds. I.I.S., Bangalore, Organic Chemistry, 1966-69. Bhatt, Mangalore Vivekanand, Assoc. Professor.

The synthesis of 9, 10-phenanthro-cyclopropenone is in progress. The synthesis of benzocyclopropenone, cyclopropenone and some novel polycyclic and heterocyclic non-benzenoid aromatic compounds and a study of their reactions is envisaged.
547.6

1127.422 Srinivasan, K. G. Studies in homocyclic chemistry. Madras, Organic Chemistry, 1964-68. Swaminathan, S., Professor.

A route to the synthesis of benzene cyclo-octanones starting from resorcinol is being worked out.
547.6

1128.423 Srinivasan, Krishnaswami. Synthesis of polycyclic compounds. I.I.S., Bangalore, Organic Chemistry, 1960-67. Banerjee, Dilip Kumar, Professor.

Elaboration of ring A on 7-keto-3a-methyl-3a, 4, 5, 7, 8, 9, 9a, 9b-octahydrobenzindan-3-carboxylic acid (I) has been attempted on the lines of a model of addition of vinyl methyl ketone to $\triangle^{1(9)}$-octalin-2-one. The results not being encouraging, alternate routes have been investigated and a new scheme for synthesis of 19-norprogesterone from (I) is nearing completion.

547.6

Hydrocarbons

1129.424 Barve, V. P. Studies in lignans. Bombay, Institute of Science, 1963-67. Kulkarni, A. B., Professor and Head of the Department of Chemistry.

3-carboxy-4-phenyl-(3′, 4′,5′-trimethoxy)-6, 7- dimethoxy-1-tetralone has been prepared and converted into 3-carboxy-2,2-dihydroxy-methyl-4-phenyl-(3′,4′,5′-trimethoxy) - 6, 7-dimethoxy-1-tetralol, an analogue of isosikkimotoxin. Two isomeric-3-carbomethoxy-2-hydroxymethyl-4-phenyl - (3′,4′,5′-trimethoxy) -6,7- dimethoxy-1-tetralol have been prepared and their stereochemical configuration is under investigation.

547.613

1130.425 Brahmadeo Prasad Singh. Photochemistry of anthracene derivatives. Jadavpur, Physical Chemistry, 1966-68. Rohatgi, K. K., Reader.

The dimerization and autoxidation of anthracene have been considered to have some importance for the storage of solar energy. A fundamental study of the photochemistry of anthracene derivatives will throw light on the primary processes involved in the autoxidation and dimerization of anthracene.

547.616

1131.426 Choudhari, P. G. Studies in lignans. Bombay, Institute of Science, 1963-67. Kulkarni, A. B., Professor and Head of the Department of Chemistry.

3, 4, 4′-trimethoxy benzophenone has been condensed with diethyl succinate to get benzylidine succinic acids. These acids have been reduced with sodium amalgam and cyclised to get 3 - carboxy - 4 -phenyl-(4′-methoxy)-6, 7-dimethoxy-1-tetralone. Stereochemical configuration of the tetralone is being studied. This tetralone has been condensed with formaldehyde to get 3-carboxy-2, 2-dihydromethyl-4-phenyl-(4′-methoxy)-6,7-dimethoxy-1-tetralone-2, 3-lactone.

547.613

1132.427 Dabas, Khazan Singh. Study of polynuclear aromatic hydrocarbons. Kurukshetra, Chemistry, 1965-67 Mukherji, S. M., Professor and Head of the Department.

The study of catenoid alkylation reactions with naphthalene and its derivatives is in progress. 3,9-dimethyl chrysene has been synthesised through Colonge-Mukherji cycialkylation reaction.

547.61

1133.428 Dharma Chandra. Synthesis of certain new phenothiazines and a study of some of their physico-chemical properties and pharmacological activities. Rajasthan, Chemistry, 1966-68. Mital, Ramji Lal, Reader and Sharma, V. N., Professor and Head of the Department of Pharmacology, S.M.S. Medical College, Jaipur.

Phenothiazines and their derivatives are being synthesised by the thionation of appropriate diphenylamines, Smiles rearrangement of 2-amino-2′ nitro diphenylsulphide and other routes etc., and a study of their physico-chemical properties and pharmacological activities is planned.

547.613

1134.429 Janarthanan, B. Stereochemical studies on cyclohexane derivatives. Annamalai, Chemistry, 1962-67. Balasubramanian, M., Reader.

A number of mono, di- and tri-substituted cyclohexanols and cyclohexanones have been prepared. Grignard addition of methylmagnesium iodide and phenylmagnesium bromide to a number of cyclohexanones has been carried out to study the stereochemistry of addition. The addition products will be analysed by vapour phase chromatography. It is also proposed to carry out kinetics of cyanohydrin formation.

547.61

1135.430 Parbath Singh, U. Applicability of the Hammett equation to naphthalene derivatives. Annamalai, Chemistry, 1964-68. Baliah, V., Professor and Head of the Department.

A number of 2-naphthyl-amines have been prepared and it is proposed to determine their dissociation constants. Some 6-substituted 2-naphthols have also been prepared.

547.615

1136.431 Puri, Indra. Synthesis of polycyclic aromatic hydrocarbons. Kurukshetra, Chemistry, 1964-67. Mukherji, S. M., Professor and Head of the Department.

Colonge-Mukherji reaction has been studied and its scope extended to acenaphthene. Acephenanthrene, acechrysene and benzotetraphene systems have been synthesised by this method. Dienone phenol rearrangement has been studied and tetraphene system synthesised. Synthesis of tetraphene system by an alternative route is also under study.

547.61

1137.432 Sinha, Bhabani. Studies on biphenyl derivatives. Jadavpur, Chemistry, 1966-68. Ghosh, N. R., Reader.

Studies on the photoracemisation of optically active biphenyl derivatives are in progress.

547.613

1138.433 Sivaprakasam, R. Applicability of the Hammett equation to naphthalene derivatives. Annamalai, Chemistry, 1960-66. Baliah, V., Professor and Head of the Department.

A number of substituted 1- and 2-naphthoic acids and their methyl esters have been prepared. The dissociation constants of these acids have been determined by the conductivity method. A study of the kinetics of alkaline hydrolysis of the esters has also been made.

547.615

1139.434 Thomas, T.C. Studies in acenaphthene derivatives. Baroda, Chemistry, 1966-68. Sethna, Suresh, Professor.

5-hydroxy acenaphthene has been formylated and acetylated, and the formyl and the acetyl derivatives have been converted into acenaphthofuran derivatives. The α and γ pyrone rings have also been built up on acenaphthene. Mannich bases have also been prepared from 5-hydroxyacenaphthene.

547.616

Halogen Derivatives

1140.435 Ramalingam, K. A study of the reactivity and conformation of cyclohexylamines. Annamalai, Chemistry, 1962-67. Balasubramanian, M., Reader.

A number of stereo isomeric substituted cyclohexylamines and their corresponding N,N-dimethyl derivatives have been prepared. The rates of addition of methyl iodide to the substituted N,N-dimethylcyclohexylamines in methanolic solution at two temperatures have been measured in order to study the relation between reactivity and conformation.

547.62

1141.436 Zahera Jabeen. A kinetic study of the bromination of some aromatic compounds. Madras, Physical Chemistry, 1966-70. Ganesan, R., Lecturer.

A kinetic study of the bromination of some aromatic compounds will be made in the temperature range 60°-90°C. A new experimental technique will be attempted. The results obtained will be compared with a similar study that has already been carried out at lower temperatures.

547.62

Oxy & Hydroxy Derivatives

1142.437 Bhattacharyya, Kalyan Kumar. Mixed ligands complexes. Burdwan, Chemistry, 1966-68. Dutta, Rabindra Lal, Reader.

Mixed ligands complexes of the type Co $(AA)_2$ $(AA^*)X_3$ are being prepared and characterised. Ligands AA* have been obtained by introducing substituents to AA when AA=biguanide etc. Their optical isomers are being separated. These works will be extended to study recivaination kinetics also.

547.632

1143.438 Dholakia, Vipulchandra Navranglal. Studies in coumarins. Baroda, Chemistry, 1965-67. Trivedi, K. N., Reader.

The work deals with the synthesis of 4H-furo-(3,2-C)-benzopyran-4-one from 4-hydroxycoumarin derivatives. About five furano coumarins of this type have been synthesised by first subjecting 4-hydroxycoumarins to Pechmann reaction followed by bromination, hydrolysis and ring closure. Several 4-hydroxy coumarino-α-pyrones and bi-4-hydroxy coumarinyls have also been synthesised.

Synthesis of 4-H-furo-(3,2-C) benzopyrone-4-one : A furocoumarin. Chem. & Ind. 1966 : p. 160.

547.637

1144.439 Dingankar, P. R. Synthesis of polycyclic compounds: Oxygen isosters of carcinogenic hydrocarbons. Bombay, Chemical Technology, 1963-67. Gore, T. S., Lecturer.

Napthodifurans have been prepared from corresponding dihydroxynapthalenes. These are being tested for carcinogenicity. The synthesis of napthodipyrans is being carried out. A series of furanoquinones are also being prepared and mesomethylated to obtain the corresponding di-methyl derivatives which will be tested for their carcinogenic activity.

547.63

1145.440 D'souza, A. J. Chemistry of amino anthraquinones. Bombay, St. Xavier's College, Bombay, 1963-67. Nadkarney, V. V.

Diazotisation of β amino anthraquinone and coupling with different naphthols, cresols, acetoacetic ester etc., has been carried out. Bromination of β. amino anthraquinone under different conditions of temperature, catalyst, solvent and deoxidants is being studied. The preparation and study of the chemistry of thioureas and isocyanates from the amines will also be taken up.

547.633

1146.441 Ghosh, Prasantakumar. Studies on biophenol A. Calcutta, Applied Chemistry, 1965-67. Saha, A. N., Lecturer.

547.632

1147.442 Ingle, Dnyanoba Bhanudas. Study of complexes of aromatic hydroxy compounds with metals. Marathwada, Chemistry, 1962-67. Khanolkar, D. D., Professor.

Potentiometric and spectrophotometric study of chelates of substituted phenols with cations belonging to transition and rare earth group metals in dioxane-water mixture have been undertaken to determine stability constants at different temperatures as also to calculate thermodynamic quantities, like free energy, enthalpy etc.

547.633

1148.443 Jamkhandi, Purushottam Sidramappa. Chemistry of anticoagulants. Karnatak, Chemistry, 1962-66. Rajagopal, S., Reader.

The sulphur analogues of the very valuable anticoagulants, like Dicoumarol, Warnarin Coumechlor, etc., which are derivatives of 4-hydroxycoumarin, have been synthesised and screened for anticoagulant activity.

547.637

1149.444 Janak Singh. Organic Chemistry. Banaras, Chemistry, 1966-67. G. B. Singh, Head of the Department of Chemistry.

The structure of dimerisation products obtained by the cyclodehydration of β-benzoylphenyl isocrotonic acid (I) is under investigation. Treatment of the acid (I) with acetyl chloride, under anhydrous conditions, gives rise to these products. Extensive degradation and physical methods are being used for elucidation of structure.

547.632

1150.445 Kalp Nath Singh. Physico-chemical studies of coordination complexes. Banaras, Chemistry, 1966-67. S. Prasad, Reader.

The complex formation of anhydrous $MoCl_5$ with different organic ligands e.g. primary, mono- & di-, secondary and tertiary amines and heterocyclic bases is being carried out. The anhydrous $MoCl_5$ has been successfully prepared in the absolute inert atmosphere (N_2-gas) by passing dry Cl_2 gas over heated O_2-free metal powder. The structural formula of the prepared complexes will be assigned by infrared spectra, ultraviolet spectra and magnetic measurement.

547.632

1151.446 Kuriakose, A. P. Studies on dihydroxynaphthalenes. Baroda, Chemistry, 1964-66. Sethna, Suresh, Professor.

Naphtho (2, 1, b, 6, 5-b^1) difuran and its 1, 6-dimethyl derivative have been synthesised starting with 2, 6-dihydroxy-naphthalene. The synthesis of naphtho di-α-and γ-pyrones has also been carried out from the same dihydroxynaphthalene.

Jour. Ind. Chem. Soc. 43 ; 1966 : p. 437-439.

547.633

1152.447 Munawar Hasan. Alkoxide and allied compounds of lanthanide elements. Jodhpur, Chemistry, 1966-68. Kapoor, Ramesh Narain, Reader.

Organometallic compounds of some lanthanide elements will be synthesised from the lanthanon halide or the alkoxides. The reactions of various lanthanon alkoxides with organic ligands will be carried out and the corresponding compounds studied for molecular complexity, thermal stability and sublimation etc.

547.63

1153.448 Pal, Arunkumar. Investigations on some aspects of the nature of the ligand field in the complexes of some iron groups of salts by paramagnetic resonance and other methods. Calcutta, Chemistry, 1962-67. Bose, A., Professor, Indian Association for Cultivation of Science, Calcutta.

547.632

1154.449 Parekh, Mansukh Gopaldas. Studies and synthesis of cyclohexeno coumarins. Baroda, Chemistry, 1965-67. Trivedi, K. N., Reader.

The work deals with the synthesis of cyclohexenocoumarins. The cyclohexenocumarins viz. 5, 6-cyclohexenocoumarins, 5, 6-cyclohexeno-7, 8-benzocoumarins and 7, 8 cyclohexenocoumarins have been synthesised by first subjecting resorcinol and α-naphthol to succinoylation followed by reduction, Pechmann reaction and cyclisation.

547.637

1155.450 Ramamani, R. A physico-chemical study of some metal thiol complexes. Madras, Pachaiyappa's College, Madras, 1964-68. Shanmuganathan, Sp., Professor and Head of the Department of Chemistry, Pachaiyappa's College, Madras.

Several ortho substituted thiophenols and phenols have been prepared and the stability constants of the complexes of these ligands with metals, like copper, iron, cobalt, nickel, zinc and manganese will be determined by the potentiometric method at various temperatures. Solid complexes of these ligands with the above metals will also be isolated and their physico-chemical properties studied.

547.632

1156.451 Ray, Kuladaranjan. Studies on complex compounds with polydentate ligands. Calcutta, Chemistry, 1958-67. Ghosh, N. N., Lecturer.

547.632

1157.452 Rohatgi, V. K. Synthesis of 3-phenyl 4-hydroxy coumarins. Delhi, Chemistry, 1964-67. Seshadri, T. R., Professor Emeritus and Jain, A. C., Reader.

The action of alkaline hydrogen peroxide on α-methoxy chalkones has been studied and a novel synthesis of 3-phenyl 4-hydroxy coumarins achieved.

(1) Curr. Sci. 35 ; 1966 : p.35 ; and (2) Tet. Let. 24 ; 1966 : p.2701-2705.

547.632

1158.453 Sankhla, Babu Singh. Alkoxides and allied compounds of samarium. Jodhpur, Chemistry, 1964-66. Kapoor, Ramesh Narain, Reader.

Alcoholates and alkoxides of samarium have been prepared from anhydrous samarium chloride. The samarium isopropoxide has been allowed to react with phenol, acyl halides, β-diketone and β-keto esters, glycols and ethanolamines in different molar ratios to give the corresponding compounds of samarium. Acylates of samarium are also being prepared and studied.

(1) Chem. & Ind. 382 ; 1965 ; (2) Jour. Less Com. Met. 10 ; 1965 : p. 116 ; (3) Can. Jour. Chem. 44 ; 1966 : p.1369 ; and (4) ibid. 20 ; 1966 : p.2131.

547.63

1159.454 Sarkar, Gaurangaprasad. Stereospecific reduction of organic molecular and synthetic studies in cyclohexenone derivatives. Calcutta, Pure Chemistry, 1964-67. Nasipuri, D., Reader.

547.636

1160.455 Subrahmania Ayyar, Krishna Iyer. Synthesis of todomatuic acid and its analogues. I. I. S., Bangalore, Organic Chemistry, 1961-67. Krishna Rao, Gummadithala Sri, Lecturer.

Synthesis of a mixture of diastereomers of todomatuic acid starting from 2-(p-methoxyphenyl)-6-methylheptan-4-one by a seven step route has been achieved. The aromatic analogue of todomatuic acid has been synthesised starting from 2-phenyl-6-methyl-heptan-4-one by a four step route. Naturally occurring (+) ar-turmerone has also been converted to ar-todomatuic acid.

547.637

1161.456 Tak, Bal Kishan. Synthetic studies of phenol betaines. Jodhpur, Chemistry, 1965-68. Saxena, J. P., Reader.

The phenol betaines of substituted 7-(anilino benzyl)-8-quinolinol and that of substituted quinolinium hydroxyphenyl styrenes system have been prepared. Their absorption spectra with regard to solvent interaction is under studp.

547.632

1162.457 Taploo, Choni Lal. Studies on some new anils and their interaction with lewis acids and heavy metal ions. Roorkee, Chemistry, 1964-67. Malik, Wahid-uddin, Professor and Head of the Department and Gupta, Devi Ram, U. P. Agricultural University, Pantnagar.

New anils of phenyl glyonal and their substitute derivatives have been synthesised and characterized by infrared studies. Phenocylidene aniline oxime and p-bromo phenacylidene p-dimethyl amino aniline have been interacted with copper. Various lewis acids and their physico-chemical properties are being studied by absorption measurements and magnetic susceptibility.

Jour. Chem. Engg. Data. 11(2) ; 1966.

547.636

Nitrogen Derivatives

1163.458 Dalal, J. P. Chemistry of fluorence and related compounds. Bombay, St. Xavier's College, Bombay, 1962-67. Nadkarney, V. V.

The nitration of flourene has been studied in detail and the amino derivatives have been converted into thiourea derivatives. The isocyanate derivatives are found to be useful for the identification of amines etc., and estimation of metals, like Cu, mercuration and bromination are being investigated under different conditions.

547.64

1164.459 Hadapad, Siddappa Basappa. Infrared intensities of some organic nitriles in the condensed phase. Karnatak, Chemistry, 1964-68. Jayadevappa, Ettigi Sivappa, Reader.

The absolute intensities of several organic nitrile fundamental vibrations will be determined in the pure liquid phase and correlations made with those in other phases. Intensity determinations in chosen polar and non-polar solvents will also be made and a study of intermolecular perturbations attempted.

547.644

1165.460 Haibatti, Shivanappa Khandappa. Infrared study of some nitrile complexes. Karnatak, Chemistry, 1964-68. Jayadevappa, Ettigi Sivappa, Reader.

Some donor-acceptor complexes of organic nitriles with metal halides are being studied. The purpose is to observe the perturbations produced in the ligand bond frequencies and the intensities of the normal vibrations of the ligand molecule.

547.644

1166.461 Jaimni, Jag Pravesh Chandra. Studies of metal complexes of phenylhydroxylamine derivatives. Rajasthan, Chemistry, 1964-66. Sogani, Naveen Chandra, Reader.

N-benzoyl-N-phenylhydroxylamine and its homologues have been synthesised and the metal chelates formed by them are under study. Effect of different groups of various ligand molecules upon the stabilities of metal chelates have been studied.

(1) 3-hydroxy-1-p-sulphonatophenyl-3-phenyltriazene as a metal indicator for complexometric determinations of iron (III) with EDTA. Z. Anal. Chem. 204 ; 1964 : p.181 ; (2) Stability of palladium chelate of sodium-p-(mercapto-acetamido) benzene sulphonate. Bull. Acad. Polon. Sci. 13 ; 1965 : p.371 ; (3) Sodium-p-(mercapto-acetamido) benzene sulphonate as a spectrophotometric reagent for nickel. Jour. & Proc. Inst. Chemists. 37 ; 1965 : p.162 ; and (4) Complexometric determination of iron in natural samples using 3-hydroxy-1-p-sulphonatophenyl-3-phenyltriazene as a metal indicator. ibid. 38 ; 1966 : p. 123.

547.642

1167.462 Patel, Vithalbhai S. Some aspects of quinazoline chemistry. Patel, Chemistry, 1964-66. Patel, S. R., Reader.

Reaction mechanism for Niementowski-4-ketoquinazoline has been established. This method of synthesis has been modified to improve its applicability. Reactions of different 3 : 1 : 4-benzoxazones with various amines leading to the synthesis of 4-ketoquinazoline derivatives have been systematically studied to arrive at the structure-action relationship and the probable reaction mechanism.

547.64

1168.463 Sarma, Pabitra Kumar. Studies on sulphenyl derivatives of O-mercapto azo compounds. Gauhati, Chemistry, 1966-68. Choudhury, Arunmani, Reader.

5-nitro O-toluyl azobenzene 2-sulphenyl bromide has been synthesised and the corresponding sulphenyl tribromide, chloride, iodide, perchlorate, cyanide and thiocyanate have been prepared. The condensation products of the sulphenyl bromide with phenols and alkylmethylketones are being isolated and charactecharacterised. Starting from azobenzene 2-sulphenylbromide and the bromide mentioned above, benzothiazolylalkyl ketones have also been prepared.

547.643

1169.464 Shahnashah Husain. Synthesis and pharmacological activity of some alkali substitutes of beta-paeylothylamine derivatives. Aligarh, Chemistry, 1966-69. n.g.

547.642

Metallic Compounds

1170.465 Galgali, Vasant Hanmantrao. Studies in organometallic compounds. Marathwada, Chemistry, 1963-67. Khanolkar, D. D., Professor.

Solid complexes of metals, such as, Cu, Ni, Mn, Co, Zr, Fe, Cd, Hg etc., with 1-amino-5-benzoyl thiazole and some Schiff's bases are being prepared to study their structures by employing magnetic, spectrophotometric and other experimental techniques.

547.65

1171.466 Jagirdar, Dattatraya Vyankatesh. Studies of metal complexes of substituted salicylic acids. Marathwada, Chemistry, 1964-67. Khanolkar, D. D., Professor.

Stability constants of complexes of cations belonging to transition metals and lanthanide group elements with various substituted salicylic acids are being studied by potentiometric and spectrophotometric methods at different temperatures. These values will be utilised to calculate various thermodynamic quantities to understand the effect of substitution on complex formation and structures of these complexes.

547.65

1172.467 Prabhu, L.H. Formation constants of some metal complexes of naphthalene derivatives. Bombay, Atomic Energy Establishment, Trombay, 1963-67. Athavale, V. T., Head, Analytical Division, Atomic Energy Establishment, Trombay.

Determination of solution stability constants of metal chelates of Cu^{2+}, Ni^{2+}, Zn^{2+}, Cd^{2+}, and UO_2^{2+}

with 2-nitroso-1-naphthol and its sulphonic acid derivatives and also with 2-amino-1-naphthol-4 sulphonic acid has been carried out by Bjerrum-Calvin titration technique in 75% v/v dioxan water mixture at 30°C to study the relation, log k=apk+b, of closely related chelating agents.

547.65

Sulphur Compounds

1173.468 Nagle, Suresh Krishnarao. Antibacterials—2-amino-6-benzothiazolylphenyl sulphides, sulphones, ethers and ketones. Bombay, Parle College, Bombay, 1964-67. Nargund, K. S., Professor, Parle College, Bombay.

4-nitrophenyl, phenyl sulphides and ethers have been prepared by the condensation of p-chloronitrobenzene with various thiophenols and phenols. The sulphides have been oxidised to sulphones. Substituted 4-nitro benzophenones have also been obtained by the condensation of p-nitrobenzoyl chloride with various aromatic compounds. The nitro compounds have been reduced to amino compounds and converted into benzothiazoles by thiocyanation.

547.66

1174.469 Shinde, Bhalchandra Ramchandra. Antibacterials—aryl or alkyl benzothiazolyl sulphides, sulphones and ethers. Bombay, Parle College, Bombay, 1964-67. Nargund, S. K., Professor, Parle College, Bombay.

2-mercaptobenzothiazole, 2-mercapto-5-chlorobenzothiazole and 2-mercapto-5-methyl benzothiazole have been condensed with various alkyl and benzyl halides to obtain 2-alkyl or benzyl benzothiazoles. These have been oxidised to sulphones. 2-chloro benzothiazole, 2-chloro-5-methyl benzothiazole and 2-5-dichloro benzothiazole have also been condensed with various phenols and thiophenols. Sulphones have been obtained by oxidation.

547.66

Natural Products

1175.470 Basu, Sudamchandra. Chemistry of plant products. Calcutta, Pure Chemistry, 1965-67. Chatterjee, Asima, G. B. Singh, Professor.

547.7

1176.471 Bhatnagar, Surendra Prasad. Chemistry of natural products. Aligarh, Chemistry, 1965-68. Wasiur Rahman, Reader.

547.7

1177.472 Bose, Samerandranath. Chemical investigation of Indian medicinal plants and plant products. North Bengal, Chemistry, 1966-68. Khastgir, Hari Narayan, Head of the Department.

Chemical investigations have been undertaken of plants not hitherto investigated. It is proposed to study the structure of compounds by chemical and modern physical methods, viz. ultraviolet, infrared and NMR spectroscopy etc. Problems of biogenetic interest and stereochemical problems, if any, will also be studied.

547.7

1178.473 Dixit, Sudhir Motiram. Studies in the chemistry of natural products. Bombay, National Chemical Laboratory, Poona, 1964-67. Rao, A. S., Asstt. Director, National Chemical Laboratory, Poona.

Oxidation of cholanic acid and related compounds and transformations of 1,5-dioxodecalin are being studied.

547.7

1179.474 Gandhi, Ravinder Nath. Natural products. Delhi, Chemistry, 1964-67. Seshadri, T. R., Professor Emeritus and Rajagopalan, T. R., Reader.

A study of the hepatotoxic components of some plants and seeds, which are being used as medicines, has been undertaken. Identification and elucidation of the structures of active components isolated in pure state is in progress.

547.7

1180.475 Garg, Santosh Kumar. Studies on some organic compounds isolated from lauraceae, solanaceae and euphorbiaceae families. Roorkee, Chemistry, 1962-66. Malik, Wahid-uddin, Professor and Head of the Department and Gupta, D. R., Head of the Department of Chemistry, U. P. Agricultural University, Pantnagar.

Isolation and structural elucidation of organic compounds from Indian medicinal plants belonging to liliaceae and rosaceae families is being carried out.

547.7

1181.476 Ghani, Shagufta Jahan. Chemistry of plant products. Aligarh, Chemistry, 1965-68. Wasiur Rahman, Reader.

547.7

1182.477 Jain, Darshan Kumar. Chemistry of natural products. Aligarh, Chemistry, 1966-69. Kidwai, A. R., Professor and Head of the Department.

547.7

1183.478 Kalyanaraman, P. S. Studies in the chemistry of natural propucts. Madras, Presidency College, Madras, 1966-69. Pai, B. R., Chief Professor of Chemistry, Presidency College, Madras.

Work is being done on the identification of natural products by chemical and physical methods and by synthetic approaches.

547.7

1184.479 Khanna, Vinod Kumar. Chemistry of natural products. Delhi, Chemistry, 1966-69. Seshadri, T. R., Professor Emeritus and Jain, A. C., Reader.

547.7

1185.480 Krishnan, V. Chemistry of natural products. Delhi, Chemistry, 1963-67. Rangaswami, S., Professor.

Two medicinal plants have been taken up for study. Phenolic compounds have been isolated and their chemical nature is being studied.

547.7

1186.481 Malhotra, Ashwani. Chemistry of natural products. Delhi, Chemistry, 1964-67. Seshadri, T. R., Professor Emeritus and Murti, V. V. S., Professor.

(1) Tet. Let. 36 ; 1965 : p. 3191 ; (2) Curr. Sci. 17 ; 1966 : p. 437-438 ; and (3) Tetrahedron. 23 ; 1967 : p. 405.

547.7

1187.482 Misra, Debaranjan. Investigation on Indian medicinal and other plants and plant products. North Bengal, Chemistry, 1966-68. Khastgir, Hari Narayan, Head of the Department.

The research deals with the isolation of natural compounds from plants and their structure elucidation, stereochemistry and biogenetic implications.

547.7

1188.483 Mohan Murali, Bankapur Krishnamurthy. Studies in synthetic drugs, and oils and fats. I. I. S., Bangalore, Organic Chemistry, 1961-66. Harihara Iyer, Balakrishna, Professor.

P-pyridoylaminobenzoic acids, their glycine and DL-methionine conjugates and their derivatives, such as, esters, hydrazides and the aldehyde derivatives of the hydrazides have been synthesised (105 compounds) and tested for in vitro antituberculosis activity by the serial dilution method using surface culture technique. The fatty oil from 'Elaeodendron paniculata' seeds is being analysed.

Jour. IIS. 47(4) ; 1965 : p. 133.

547.7

1189.484 Mohd. Ilyas. Chemistry of natural products. Aligarh, Chemistry, 1966-69. Wasiur Rahman, Reader.

547.7

1190.485 Mukhopadhyay, Kalisankar. Plant products. Calcutta, Pure Chemistry, 1964-67. Chatterjee, Asima, G. B. Singh, Professor.

547.7

1191.486 Muthukumaraswami, N. Studies in the chemistry of the natural products. Madras, Presidency College, Madras, 1964-67. Pai, B. R., Chief Professor of Chemistry, Presidency College, Madras.

Work is being done on the isolation of natural products, their structural elucidation by chemical degradation and physical methods and also their synthesis.

547.7

1192.487 Narandra Kumar. Chemistry of plant products. Aligarh, Chemistry, 1965-68. Kidwai, A. R., Professor and Head of the Department and Sharma, V. N., Senior Scientific Officer, National Botanic Garden, Lucknow.

547.7

1193.488 Panda, Venkateswarlu. Chemical examination of some Indian medicinal plants. Delhi, Chemistry, 1964-67. Rangaswami, S., Professor.

A few Indian rhododendron species are being examined systematically for their chemical components.

547.7

1194.489 Pradhan, Bhim Prasad. Chemical investigation of Indian medicinal plants and plant products. North Bengal, Chemistry, 1965-67. Khastgir, Hari Narayan, Head of the Department.

Chemical investigations have been undertaken of plants not hitherto investigated. It is proposed to study the structure of compounds by chemical and modern physical methods, viz. ultraviolet, infrared and NMR spectroscopy etc. Problems of biogenetic interest and stereochemical problems, if any, will also be studied.

547.7

1195.490 Ray, Pratip Ranjan. Interaction of macromolecules with clay minerals. North Bengal, Chemistry, 1966-68. Chakravarti, S. K., Reader.

In view of the important role of proteins, humic acids and other macromolecules in soil aggregation, stabilisation, and plant nutrition, the exact mechanisms of these interactions, their selectivity, equilibrium and thermodynamic properties are being studied in detail.

547.7

1196.491 Sarangan, S. Chemistry of natural products. Delhi, Chemistry, 1966-69. Rangaswami, S., Professor.

547.7

1197.492 Sharma, Ramesh Chandra. Studies in some naturally occurring plant phenolics. Aligarh, Chemistry, 1966-69. n.g.

547.7

1198.493 Sharma, Sheela. Physico-chemical studies of some problems of Indian system of medicine. Banaras, Chemistry, 1965-67. Dasgupta, B. N., Reader, Medicinal Chemistry.

The petroleum ether extract of Alangium Lamarckii on fractionation yields four compounds A, B, C and D. On the basis of colour reactions, ultraviolet and infrared studies, compound A (m.p. 152°-154°C, $[\alpha]_D$ 20°-38.8) and B (m.p. 191°-193°C, $[\alpha]_D$ nil) appear to be sterols, whereas compound C (m.p. 252-255°C, $[\alpha]_D$-21.18) and D (m.p. 262°-265°C) appear to be triterpenoids.

Experientia. 22 ; 1966 : p. 647-648.

547.7

1199.494 Subramanayam Raju, Muppala. Chemistry of medicinal plants and the synthesis of related compounds. Osmania, Chemistry, 1966-68. Subba Rao, Nanduri Venkata, Professor and Head of the Department.

Chemical examination has been undertaken of mesus ferrea (Family-Guttiferea) seeds, bark and leaves to synthesise substituted 4-phenyl coumarins and to test their physiological activity.

547.7

1200.495 Thakur, Swapnadip. Chemical investigation of some Indian medicinal plants. Burdwan, Chemistry, 1966-68. Ghosh Majumdar, Subhendu, Lecturer.

Natural products from Indian medicinal plants have been isolated and their physical properties studied. Their characterisation with the help of physical methods, like ultraviolet, infrared, NMR etc., followed by chemical degradation experiments is in progress.

547.7

1201.496 Thomas, Mani. Studies in natural products. I. I. S., Bangalore, Organic Chemistry, 1963-69. Kasturi, Tirumalachar Rangachar, Lecturer.

Two compounds, isolated from the essential oil of Ageratum conyzoids, have been shown to be 7-methoxy-2, 2-dimethyl-chromene and the dimer of 6, 7-dimethoxy-2, 2-dimethyl-chromene. Dihydroacorenone has been synthesised starting from anisole and its conversion to acorenone is in progress.

547.7

1202.497 Usmani, J. N. Chemistry of natural products. Aligarh, Chemistry, 1966-69. Wasiur Rahman, Reader.

547.7

1203.498 Zaidi, M. Fasih. Chemistry of natural products. Aligarh, Chemistry, 1966-69. Zaman, Asif M.

547.7

Terpenes & Essential Oils

1204.499 Adhya, Samir Kumar. Study of the constituents of essential oils of Indian plants. Burdwan, Chemistry, 1966-69. Dutta, Jadugopal, Reader.

The essential oils occur abundantly in Indian plants. The chemical constituents of these have already been investigated in many cases by Simonsen, Guha, Bhattacharyya, Sukhdeb and others. It is planned to carry out a thorough investigation of these constituents by modern methods, such as, V.P.C., T.L.C. etc. Synthetic experiments on commercially important products are in progress.

547.71

1205.500 Alexander, Jose. Investigations in terpenoids. I. I. S., Bangalore, Organic Chemistry, 1966-69. Krishna Rao, Gummadithala Sri, Lecturer.

Investigations on dehydration of linalool show that sulfosalicylic acid gives about 17.5% of β-trans-ocimene. One of the keto acids obtained by the thermal rearrangement of its maleic anhydride adduct gives a lactone on treatment with p-toluene sulphonic acid.

547.71

1206.501 Angadi, Veerabhadrappa Bashetteppa. Synthetic investigations in terpenoids. I. I. S., Bangalore, Organic Chemistry, 1960-67. Banerjee, Dilip Kumar, Professor.

A method has been developed for the preparation of 3-keto-9-methyl-$\Delta^{4,6}$-and 3-keto-4, 9-dimethyl-$\Delta^{4,6}$-hexahydronaphthalenes in good yield. Hydrogen cyanide has been added to 9-methyl-Δ^{4}-octalone-3 and 9β-methyl-8β-hydroxy-Δ^{4}-octalone-3, cis- and trans-isomers obtained in both cases have been characterised. A synthesis of carrisone is nearing completion.

(1) Jour. Org. Chem. 26 ; 1961 : p. 2988 ; (2) Tetrahedron. 21 ; 1965 ; p.281-291.

547.71

1207.502 Balasubramanian, Muthuswamy. Investigations in terpenes. I. I. S., Bangalore, Organic Chemistry, 1966-70. Balasubrahmanyam, Saraswathi Natarajan, Asstt. Professor.

The stereochemistry of the methylation of stereoisomeric cyclohexane vicinal polyesters and nitriles of synthetic importance in terpene chemistry has been investigated. In contrast to the former, the latter has undergone smooth elimination of nitrile groups under conditions of carbonion formation. Investigation of the kinetics of this elimination is being projected.

547.71

1208.503 Chandrashekara, Bogadi Krishnappa. Curcuminoids and related compounds. Mysore, Chemistry, 1965-68. Siddalingaiah, K. S., Reader.

Natural curcuminoids form a group of compounds with 1, 7 diphenyl-1, 6-diene-3, 5-heptadione skeletal with different substitutions at various positions in the two phenyl groups. Very little is known about the stereochemistry of this class of compounds. Present investigation aims at (i) the study of the chemistry of 1, 3-diketo system ; (ii) synthesis of reference compounds; and (iii) the study of the stereochemistry (conformation and cis-trans isomerism) of curcuminoids.

547.71

1209.504 Chattopadhyay, Nitharranjan. Synthetic studies on deterpenoids and related compounds. Calcutta, Chemistry, 1964-67. Ghatak, U. R., Reader in Chemistry, Indian Association for Cultivation of Science, Calcutta.

547.71

1210.505 Dasgupta, Tapankumar. Synthesis of sesquiterpenoids. Calcutta, Chemistry, 1964-67. Mukherjee, P. C., Professor of Chemistry, Presidency College, Calcutta.

547.71

1211.506 Datta, Sibaprasad. Studies on saponins and triterpenes. Calcutta, Chemistry, 1964-67. Barua, A. K., Reader, Indian Association for Cultivation of Science, Calcutta.

547.71

1212.507 Joseph, Thomas Kanackattuputhenpurail. Essential oils : Isolation of β-trans-ocimene from Litsea zeylanica and studies on the β-trans-ocimene-maleic anhydride adduct. I.I.S., Bangalore, Organic Chemistry, 1962-66. Krishna Rao, Gummadithala Sri, Lecturer.

A novel rearrangement of the Diels-Alder adduct of β-trans-ocimene and maleic anhydride has been discovered to furnish a bicyclic keto acid. Detailed investigations on the stereochemistry of the adduct have been carried out. The rearrangement product has been successfully elaborated to the sesquiterpene skeleton, valerenane.

Tetrahedron. 23 ; 1967 : p.519.

547.71

1213.508 Kapadia, Vibodhchandra Hiralal. Studies in terpenoids. Bombay, National Chemical Laboratory, Poona, 1961-67. Sukh Dev, Head of the Division of Organic Chemistry, National Chemical Laboratory, Poona.

The systematic study of the oil of Cyperus rotundus using modern physical methods for isolation of the various constituents present in the oil has been undertaken. The structural elucidation of some of the hitherto unknown compounds has been achieved.

547.71

1214.509 Khurana, Amrik Lal. Synthetic investigations in terpenoids. Panjab, Chemistry, 1964-67. Vig, Om Parkash, Reader.

Synthesis of the following terpenoids—humber tiol, veticadinene, sesquiphellandrene, carvone, perillaldehyde and curcumene has been achieved.

Synthesis of dl-limonene and dl-terpinene. Jour. Ind. Chem. Soc. 142 ; 1964.

547.71

1215.510 Matta, Khushi Lal. Synthetic studies in terpenoids. Panjab, Chemistry, 1961-65. Vig, Om Parkash, Reader.

The synthesis of the terpenoids particularly with isopropenyl chain as a part of their constitution is being carried out. The synthesis of sesquibenzene, eramophilone and other sesquiterpenoids, like cadinenes, is in progress. The well-known Wittig reaction is employed for the fixation of this kind of double bond to furnish the unambiguous synthesis of such terpene compounds.

547.71

1216.511 Raghavan, Eswaran. Studies in terpenes. I. I. S., Bangalore, Organic Chemistry, 1963-68. Banerjee, Dilip Kumar, Professor and Kasturi, Tirumalai Rangachar, Lecturer.

The structure of the solid adduct, obtained by treatment of methyl abietate with tetrachloro-o-benzoquinone in xylene, has been shown to be 2- [2′, 2′-(5′, 6′, 7′ 8′-tetrachloro-benzo-1′, 4′ -dioxano)] -ethyl-3, 4, 4a(α), 4b, 5, 6, 7, 8, 8a(α). 9-decahydro-4b (β), 8 (β)-dimethyl-8 (α)-carbomethoxyphenanthrene. This adduct has been utilized for a short synthesis of methyl 13-methoxy-deisopropyldehydroabietate, a key intermediate in the synthesis of terpenes and steroid analogues.

Tetrahedron. 22 ; 1966 : p. 745-752.

547.71

1217.512 Ramamoorthy, Belagaje. Investigations in terpenoids. I.I.S., Bangalore, Organic Chemistry, 1965-69. Krishna Rao, Gummadithala Sri, Lecturer.

D-Pulegone has been converted stereospecifically to (+)-trans-carane via its pyrazoline in about 72% yield.

Investigations on other reactions of pulegone are being continued.

547.71

1218.513 Ray, Sujata. Studies on terpenoids. Calcutta, Chemistry, 1965-68. Maiti, P. C.

547.71

1219.514 Saha, Lakshminarayan. Synthesis of sesquiterpenoids. Calcutta, Chemistry, 1964-67. Mukherjee, P. C., Professor of Chemistry, Presidency College, Calcutta.

547.71

1220.515 Sampath Kumar, P. S. Non-fatty components of non-edible oils. Delhi, Chemistry, 1966-69. Seshadri, T. R., Professor Emeritus and Murthi, V. V. S., Reader.

547.71

1221.516 Sankara Ram, Krishna Iyer. Synthetic investigations on terpenes. I. I. S., Bangalore, Organic Chemistry, 1963-68. Banerjee, Dilip Kumar, Professor.

For the projected synthesis of vetivone, a bicyclic ketone isolated from vetiver oil, the ketal of 3, 4-dimethoxycarbonylcyclopentanone has been converted to 3,4- dicyanomethylcyclopentanone via the corresponding dicarbinol and ditosylate. The ketal of 3, 4-dicyanomethylcyclopentanone has then been converted to 3, 4-dicyanoethylcyclopentanone via 3, 4-dimethoxycarbonylmethylcyclopentanone subjected to the same series of reactions.

547.71

1222.517 Sharma, Sain Datt. Synthesis in terpenoids. Panjab, Chemistry, 1963-67. Vig, Om Parkash, Reader.

The double bond in the isopropenyl side chain has been fired by making use of the Claisen rearrangement reaction of allyl vinyl ethers obtainable from suitably constituted allylic carbinols. Elegant synthesis of dl-carvone, dl-perillaldehyde and dl-dihydrocarvone have been achieved.

547.71

1223.518 Sobti, Ravi Ratan. Studies in terpenoids. Bombay, National Chemical Laboratory, Poona, 1963-66. Sukh Dev, Head of the Division of Organic Chemistry, National Chemical Laboratory, Poona.

Studies in various aspects of terpenoids undertaken include (i) the isolation and indentification of various triterpenoids from Calotropis gigantea; (ii) isolation and structure elucidation of diterpenes, atiserene and devadarene from Erythroxylon monogynum; (iii) biogenetic type transformations of tetracarbocyclic diterpenoids; and (iv) structure and genesis of isolongifolene.

547.71

1224.519 Soman, R. Natural products : Terpenes. Kerala, Chemistry, 1963-66. Sukh Dev, Head of the Division of Organic Chemistry, National Chemical Laboratory, Poona.

The study deals with chemical investigation of medicinal plants, and isolation and structure determination of several new diterpenes from 'Devadaru' (Erythroxylon monogynum Roxb.), devadarool, hydroxy devadarool, allodevadarool etc.

Tet. Let. 3767 ; 1964 : p. 1181.

547.71

1225.520 Srinivasan, Puliyur Rangaswami. Synthetic investigations in terpenes. I. I. S., Bangalore, Organic Chemistry, 1963-68. Banerjee, Dilip Kumar, Professor.

Nepetalactone, a monoterpenoid lactone occurring in the plant Nepeta cataria, has a high physiological activity on felids. A total synthesis of the above mentioned lactone is attempted. In this connection, studies on the Dieckmann cyclization of β-methyl-γ-carbomethoxydimethyladipate have been completed.

547.71

1226.521 Subramanian, Lakshminarayanapuram Ramaswami. Synthetic studies in terpenoids. I. I. S., Bangalore, Organic Chemistry, 1961-67. Krishna Rao, Gummadithala Sri, Lecturer.

Conversion of (+)-α-pinene to ethyl (—)-2, 2-dimethyl-3-ketocyclobutylacetate by a six step route and its conversion to homocaronic acid and its derivatives have beed achieved. Studies in the optical rotatory dispersion of cyclobutanones are in progress.

547.71

1227.522 Sugathan, Kanneth Kochappan. Studies on monocyclic terpenes. Kerala, Chemistry, 1961-66. Verghese, James, Professor.

The study mainly deals with the isomerization, hydrogen transfer, aromatisation etc., in monoterpenoids. The transformations with maleic acid throw light on reaction mechanism leading to Diels-Alder reaction. Aromatisation using pyridinium bromide perbromide is intended to introduce a new aromatising agent for terpenoids.

(1) Jour. Ind. Chem. Soc. 40 (2) : p.91-98;(2) ibid. 40 (6) : p.475-478; (3) ibid. 40 (8) : p.677-685; (4) Ind.

Jour. Chem. 2 (12) : p.497-499 ; (5) Per. Ess. Oil Rec. 56 (8) : p.518-519 ; and (6) ibid. 56(11) : p.733-736.

547.71

Alkaloids

1228.523 Ajit Singh. A study in the elucidation of structures of new diterpene alkaloids. Punjabi, Chemistry, 1960-66. Nazar Singh, Reader.

The elucidation of structure of vakatisine, one of the major alkaloids from Aconitum palmatum, has been accomplished. A study of structure of denudatine and characterization of five new alkaloids isolated from Aconitum palmatum has also been done.

(1) Chem. & Ind. 47; 1961 : p.1909; and (2) Jour. Ind. Chem. Soc. 47 ; 1965 : p.49.

547.72

1229.524 Desai, Haridutt Kantilal. Studies in the chemistry of some naturally occurring compounds. Bombay, Institute of Science, 1965-68. Merchant, J. R., Asstt. Professor.

Synthesis of three different naturally occurring aporphine alkaloids is in progress.

547.72

1230.525 Dhage, Sunil Prabhakar. Transformation of Kurchi alkaloids. Bombay, National Chemical Laboratory, Poona, 1965-67. Bhattacharyya, P. K., Asstt. Director, National Chemical Laboratory, Poona.

The transformation of certain steroidal alkaloids from Kurchi is being studied to develop a convenient route to aldosterone and some other 18-substituted steroid analogues.

547.72

1231.526 Dharma Kishore. Studies on some synthetic drugs and plant products. Rajasthan, Chemistry, 1966-69. Joshi, Bhuwan Chandra, Reader.

Synthetic analogues related to morphine will be synthesised. The structure of these compounds will be studied and efforts made to study pharmacological properties whenever possible. Extraction of active principles of some medicinal plants would be done, organic constituents isolated and efforts made to establish their constitution.

547.72

1232.527 Jaswal, S. S. A study in the elucidation of the structures of vakognavine and of a novel structure of an ester isolated from the seeds of Asphodelns Tenuifoluis Cav. (Piazi). Punjabi, Chemistry, 1964-67. Nazar Singh, Reader.

An alkaloid has been partially hydrolysed to yield another base having 2 ester groups, while the original contained 4. The base has been reduced with hydrazine to knock out one ester grouping. Reduction, oxidation and dehydrogenation studies are in progress. The ester has been acetylated and original ester and acetylated product have both been sent for NMR studies.

547.72

1233.528 Kohli, Jagmohan. Alkaloids of Sacrococca Pruniforis. Aligarh, Chemistry, 1966-69. n.g.

547.72

1234.529 Mukhopadhyay, Biswapati. Chemistry of indol alkaloids. Calcutta, Pure Chemistry, 1963-67. Chatterjee, Asima, G. B. Singh Professor.

547.72

1235.530 Nanavati, Dwipinchandra Dilsukhrai. Studies in the chemistry of Indian medicinal plants. Bombay, National Chemical Laboratory, Poona, 1960-66. Sukh Dev. Head of the Division of Organic Chemistry, National Chemical Laboratory, Poona.

Various constituents of the berries of Celastrus paniculatus are being investigated systematically. The work is directed specially to the isolation of various non-glycenidic components. The salient features of this investigation are the study of the poly-esters, unsaponifiables and the colouring matter.

547.72

1236.531 Sirkar, Prasantakumar. Isolation of naturally occurring growth substances from tropical plants. Calcutta, Chemistry, 1965-67. Sircar, S.M., Director, Bose Institute, Calcutta.

547.72

Steroids

1237.532 Arunachalam, Thangavel. Studies in steroids. I. I. S., Bangalore, Organic Chemistry, 1963-69. Kasturi, Thirumalai Rangachar, Lecturer.

Synthesis of 3-deoxy-11-oxa-$\Delta^{14'15}$-15, 16-diazaequilenin and its analogues has been achieved. The synthesis of 3-methoxy-11-oxa-$\Delta^{14'15}$-15, 16-diazaequilenin and its analogues from 6-methoxy-1-naphthol (I) has been undertaken. In this connection, various methods of dehydrogenation of 6-methoxy-1-tetralone to I have been studied and the structures for the abnormal products formed established.

Can. Jour. Chem. 44; 1966 : p. 1086-1089.

547.73

1238.533 Chaudhuri, Mridula. Influence of some hormones on heat susceptibility. Calcutta, Chemistry, 1964-67. Chaudhuri, A. K.

547.734

1239.534 Damodaran, Kalyani Muniratnam. Investigations on oxasteroids. I.I.S., Bangalore, Organic Chemistry, 1962-68. Kasturi, Tirumalai Rangachar, Lecturer.

3-cyano-3-methyl-7-methoxychroman-4-one has been prepared to synthesise an 11-oxasteroid intermediate. The structure of a rearrangement product has been elucidated. Simultaneous poly-acylations and alkylations have been observed in the Friedel-Crafts reaction of 1,3-dimethoxybenzene with 3-substituted propionic acid derivatives. Total synthesis of a B-seco-estrone derivative is in progress.

Tetrahedron. 22 ; 1966 : p.1027-1032.

547.7343

1240.535 Logani, Satish Chandra. Chemical studies in steroids. Aligarh, Chemistry, 1966-69. M. S. Ahmad, Reader.

547.73

1241.536 Lumba, Ashok Kumar. Synthetic investigations in azasteroids. Panjab, Chemistry, 1963-67. Kessar, S. V., Reader.

Methyl ether of 13-azaequlibrium has been synthesised and other routes for the synthesis of 13-azaequilibrium and 13-azaestrone are under study. A large number of intermediates for 11-azasteroids have been prepared to complete the synthesis of 11-azaequilibrium and 11-azaestrone.

547.73

1242.537 Nadamuni, Gollagunta. Synthetic investigations in steroids. I.I.S., Bangalore, Organic Chemistry, 1964-68. Banerjee, Dilip Kumar, Professor.

8-iso-10 ξ-19-nor-testosterone and 8-iso-19-nor-androst-$\Delta^{5(10)}$-en-17 β-ol-3-one have been synthesised starting from equilenin. Attempts are being made to determine the configuration of hydrogen at C_{10}. The products of hydrogenation of d-equilenin-17-ketal are being characterized. Preparation of other steroid analogues is in progress.

547.7343

1243.538 Ramakrishnan, V. T. Studies in the chemistry of homocyclic compounds. Madras, Organic Chemistry, 1964-67. Swaminathan, S., Professor.

Attempts are being made to synthesise testosterone and progesterone and their analogues using

1 α-ethynyl-1β-hydroxy-6-oxo-8a-methyl-1, 2, 3, 4, 6, 7, 8, 8a- octahydro naphthalene as the starting material.

(1) Proc. IAS. 55 ; 1962 : p.345 ; (2) ibid. 59 ; 1965 : p. 294 ; (3) Ind. Jour. Chem. 1 ; 1963 : p. 406 ; (4) Chem. & Ind. 1965 : p.1767 ; and (5) Tetrahedron. 22 ; 1966 : p.2021.

547.7343

1244.539 Ramani, Ganesan. Synthetic investigation on steroids. I.I.S., Bangalore, Organic Chemistry, 1961-67. Banerjee, Dilip Kumar, Professor.

An attempt to synthesise oestrone, the female sex hormone, from 6-methoxytetralone has been made. A project for the synthesis of 18, 19-bisnor-D-homosteroid by a short route is nearing completion.

Tet. Let. 1966 : p.5311-5319.

547.7343

1245.540 Satyanarayanamurthy, Pappu. Synthetic investigations in the field of steroids. I.I.S., Bangalore, Organic Chemistry, 1961-67. Banerjee, Dilip Kumar, Professor.

The anthracene analogue of 8-isotestosterone has been synthesised from 1 β, 2 α-(3′-acetoxycyclopentano)-2, 5-dimethyl-6-keto-1 α, 2, 3, 4, 4aα, 5α, 6, 7, 8, 8aα-decahydronaphthalene. 2, 4 : DNP of 6-dehydro-8-isotestosterone has been prepared to convert 8-isotestosterone to testosterone. 17β- hydroxy-des A-androst-9-ene-5-one and 17β-hydroxy-desA-androstan-5-one have been obtained to synthesise testosterone and/or its 10α-isomer.

Tetrahedron. 20 ; 1964 : p.2487-2498.

547.7343

1246.541 Sudarshna Rao, Kovvali Surya. Synthesis of some plant growth substances. Osmania, Chemistry, 1963-67. Ratnam, Chengalvala Venkata, Reader.

A systematic study has been undertaken to synthesise a variety of indolyl phthalamic acids and test their activity as plant growth substances. Methods for the synthesis of amino indoles with the amino group directly attached to the nucleus in either rings, or side chain amino compounds related to tryptamine and gramine have been standardised. A study of the condensation reaction of o-phenylenediamines with 1 : 4-diketones has also been undertaken to follow the reaction and identify the products formed. The effect of substituent in the o-phenylenediamine moiety on the mode of formation of heterocyclic ring formed is under investigation.

(1) Condensation of o-phenylenediamine with acetonyl acetone. (with N. V. Subba Rao and C. V.

Ratnam). Curr. Sci. 34 ; 1965 : p.403 ; and (2) Condensation of tolylene 2 : 4-diamine with benzoin. (with C. V. Ratnam). ibid. 34 ; 1965 : p.533.

547.734

1247.542 Venkataramu, Sindhaghatta Dasappa. Synthetic steroids. I.I.S., Bangalore, Organic Chemistry, 1965-70. Banerjee, Dilip Kumar, Professor.

A converging synthesis of the female sex hormone, oestrone, is under investigation using 8-methylhydrindandione as the starting material. The dione has been prepared, its configuration proved to be cis, and its condensation, with m-methoxyphenylacetylene, is under investigation.

547.7343

Proteins

1248.543 Ashraf, Syed Marghoob. Studies on the interaction of proteins with poly and heteropoly acids. Roorkee, Chemistry, 1966-69. Malik, Wahid-uddin, Professor and Head of the Department.

The mode and nature of binding of heteropoly acids with proteins are being investigated by physico-chemical methods, like pH metry, equilibrium dialysis and potentiometry etc. The studies, apart from throwing light on the nature of interaction of proteins, will help in quantitative estimation of ether. The results may also be useful for tanning and textile industries.

547.75

1249.544 Bhattacharyya, Subodhchandra. A study on the structure and properties of some fibrous proteins and related compounds. Calcutta, Chemistry, 1964-67. Saha, N.N.

547.75

1250.545 Gangopadhyay, Pankaj. Studies on some proteins with reference to the effect of electron stains. Calcutta, Chemistry, 1962-67. Dasgupta, N. N., Professor, Saha Institute of Nuclear Physics, Calcutta.

547.75

1251.546 Ghosh, Asokchandra. Physico-chemical investigation on proteins. Calcutta, Chemistry, 1963-67. Sen, Amitabha.

547.75

1252.547 Ghosh, Bijan Bihari. Fibre forming proteins from oil-seed cakes. Burdwan, Chemistry, 1966-68. Dutta, Jadugopal, Reader.

547.75

1253.548 Harbhajan Singh. Physico-chemical studies on the interaction of modified proteins with metals. Roorkee, Chemistry, 1966-67. Malik, Wahid-uddin, Professor and Head of the Department.

It is proposed to undertake (i) pH metric studies of the binding of metals, like Zn, Cu, Al, Ca, Mg, Pb with substituted protiens ; (ii) Qualitative pH metric studies of the binding of iron, chromium and aluminium oxide solutions with substituted proteins, like sulphonated gelatins and iodonated casein ; and (iii) Polarographic studies of the binding of metal ions with substituted proteins.

547.75

1254.549 Jindal, Mool Raj. Physico-chemical studies on the binding of hydrogen ions, metal ions and their hydroxide, and silicic acid with soyabean protein, casein and transfusion gelatin etc. Roorkee, Chemistry, 1964-67. Malik, Wahid-uddin, Professor and Head of the Department.

Hydrogen ion equilibria and metal ion binding studies on proteins are being conducted to find their reactive groups by employing polarographic, pH-metric and equilibrium dialysis methods etc. These studies are expected to provide valuable information regarding their biological activity and industrial utilization.

547.75

1255.550 Khan, Muazzam Ali. Study on isoenzymes. Aligarh, Chemistry, 1966-69. Kidwai, A. R., Professor and Head of the Department and Krishnamurti, C. R., Head of the Department of Biochemistry, Central Drug Research Institute, Lucknow.

547.758

1056.551 Lakshminarayanan, A. V. Structure of compounds of biological interest. Madras, Physics, 1964-68. Sasisekharan, V., Reader.

The work is connected with the conformational features of biologically important molecules. Simple individual amino acids, which form the building material for the proteins have been investigated. On the basis of the results obtained, attempts are being made to elucidate the structure of both the amino acids in the solid state and proteins. Similar investigations are also being made on nucleic acid constituents.

547.75

1257.552 Maharaj Kishan. Studies on enzyme induction. Aligarh, Chemistry, 1965-68. Siddiqi, A. M., Lectnrer (Int.) and Murti, K. (Ext.).

547.758

1258.553 Maitra, Shyamal Kumar. Studies on enzyme mechanism and its kinetics. I. I., T. Delhi, Chemistry, 1966-69. Dua, R. D., Assoc. Professor.

An enzyme glutamine has been isolated and synthesised to study its reaction mechanism and properties.

547.758

1259.554 Srivastava, S. K. Physico-chemical studies on the interaction of proteins and dyes with clay minerals. Roorkee, Chemistry, 1964-67. Malik, Wahid-uddin, Professor and Head of the Department.

The adsorption and desorption of proteins and dyes with clays and conditions of maximum binding have been investigated. The nature of interaction, on the basis of viscosity variations, has been observed and some viscometric constants calculated. Reflectance and clay membrane electrode system are being studied.

547.75

1260.555 Vasavda, N. B. Studies on amino acids and proteins of cereals and pulses of Gujarat. Gujarat, Chemistry, 1961-67. Thaker, K. A., Reader.

It is proposed to study the proximate analysis, digestibility and peptization of cereals, tubers and pulses of Gujarat. Their chromatographic separation will be effected and amino acids of dietary proteins identified. The ergosterol content of edible oils will also be determined.

547.75

Carbohydrates

1261.556 Acharya. Leena. Studies on the polyelectrolytic behaviour of plant gums. Jadavpur, Physical Chemistry, 1962-67. Chattoraj, D. K., Lecturer.

Polarographic method for estimation of gum arabic has been evolved. Light-scattering studies and viscosity measurements reveal the fact that gum arabic behaves as a polyelectrolyte, many ionisable hydrophilic groups being contained in the molecule. This has also been proved from pH titration.

547.782

1262.557 Chetal, Urmila. Physico-chemical studies on melassigenesis. Banaras, Chemistry, 1966-68. G. B. Singh, Professor and Head of the Department and Gupta, Suresh Chandra, Director, National Sugar Institute, Kanpur.

Removal of aconitic acid from B heavy molasses is of interest for manufacture of sugar. A process for the purpose has been developed using clarificants, such as, lime, common salt etc. Conditions have been worked out for maximum elimination of aconitic acid. Removal of about 30% of the acid has been achieved.

Studies on removal of aconitic acid from B heavy molasses for better performance of low grade massecuites in sugar factory. Proc. 34th Ann. Conv. S. T. A. I. Pt. 2 ; 1966 : p. 225-230.

547.781

1263.558 Logani, Mahendra Kumar. Saponins and sapogenins from Indian plants. Aligarh, Chemistry, 1965-68. Varshney, I. P., Lecturer.

547.7813

1264.559 Mahajan, Madhukar Balkrishna. Studies in the polysaccharide constituents of bamboo and their behaviour in the pulping process. Bombay, National Chemical Laboratory, Poona, 1961-67. Bose, J. L., Scientist, National Chemical Laboratory, Poona.

A detailed study of the two-stage alkaline pulping of bamboo, D. Strictus, is being made to gather more information on the peeling and stopping processes and on the mechanism of removal of pentosans in this method of pulping.

547.782

1265.560 Saroja, T. Structural studies of natural products. Delhi, Chemistry, 1965-68. Seshadri, T. R., Professor Emeritus and Mukherjee, S. K., Reader.

Structural investigation of some naturally occurring glycosides and synthesis of naturally occurring coumarins are in progress.

547.781

High Polymers

1266.561 Chattopadhyay, Tusharkanti. Studies in redox vinyl polymerisation involving chromium (vi) as the oxidant. Calcutta, Chemistry, 1964-68. Palit, S. R., Professor of Chemistry, Indian Association for Cultivation of Science, Calcutta.

547.8432236

1267.562 Das, Bebekananda. Studies in micromolecular properties of cellulose ethers in solution. Calcutta, Applied Chemistry, 1964-67. Chaudhuri, P. K., Reader.

547.84324

1268.563 Ghosh, Asokkumar. Mechanistic studies on dye-sensitized vinyl-polymerization. Calcutta, Chemistry, 1964-69. Palit, S. R., Professor of Chemistry, Indian Association for Cultivation of Science, Calcutta.

547.8432236

1269.564 Maiti, Sukumar. Some aspects of dye-sensitized vinyl polymerization. Calcutta, Chemistry, 1963-68. Palit, S. R., Professor of Chemistry, Indian Association for Cultivation of Science, Calcutta.

547.8432236

1270.565 Misra, Girish Chandra. Synthesis and properties of some co-ordination polymers. Agra, Defence Research Laboratory, Kanpur, 1966-69. Pande, L.M., Senior Scientific Officer (I), Defence Research Laboratory, Kanpur.

Synthesis of difunctional organic ligands, their conversion to polychelates and study of their physical properties, electrical and thermal, are being carried out. Some of the polychelates behave as good semiconductors whereas others show promising thermal stability.

547.84

1271.566 Pramanik, Dinabandhu. End group studies in vinyl polymerization with special reference to some new redox and photochemical initiators. Calcutta, Chemistry, 1963-67 Palit, S. R., Professor of Chemistry, Indian Association for Cultivation of Science, Calcutta.

547.8432236

1272.567 Ray, Alokkumar. Physico-chemical studies in some cellulose ethers and ethers in dilute solution. Calcutta, Applied Chemistry, 1964-68. Chaudhuri, P. K., Reader.

547.84324

Dyes & Pigments

1273.568 Agarwal, Satish Chandra. Studies on the constitution of lac. Aligarh, Chemistry, 1965-68. Kidwai, A. R., Professor and Head of the Department and Misra, G.S., Director, Lac Research Institute, Ranchi.

547.86

1274.569 Bhobe, Ramesh Achut. Study of some fluorescein complexes. Marathwada, Chemistry, 1964-66. Khanolkar, D. D., Professor.

Fluorescein complexes of rare-earth, transition metal elements etc., have been prepared and information regarding their structures has been obtained with the help of different experimental techniques, such as, magnetic measurements, electronic spectra, thermogravimetric analysis etc.

547.866

1275.570 Chadha, Haribhajan Kaur. Vat dyes and intermediates. Bombay, Chemical Technology, 1964-68. Shah, K. H., Reader.

Constitutional aspects of vat dyes are being studied. Some new intermediates have been synthesised.

547.86

1276.571 Dalal, Jagdishchandra Natverlal. Benzanthione derivatives. Bombay, Chemical Technology, 1965-67. Shah, K. H., Reader.

Constitutional studies in benzanthione vat dyes are in progress. Some nucleophilic substitutions in benzanthione series are being studied.

547.86

1277.572 Goyal, Shiv Sharan Dass. Studies on metal derivatives of azo dyes. Rajasthan, Chemistry, 1965-68. Tandon, Jagdish Prasad, Reader.

The complex formation reactions of some well-known azo dyes and some new synthesised dyes with metal ions have been studied by physico-chemical methods and similar work is in progress.

547.863

1278.573 Mahajan, Prabhakar Yeshwant. Studies in leucoanthocyanidins. Bombay, Institute of Science, 1964-68. Kulkarni, A. B., Professor and Head of the Department of Chemistry.

4′,5-dimethoxy catechin has been synthesised and attempts are being made to oxidise it to flavan-3, 4-diol. The isomeric 3-bromo and 3-chloro-flavanones of 4′,5-dimethoxy flavanone, 3′,4′,5-trimethoxy flavanone and 3′,4′,5,5′-tetramethoxy flavanone have been synthesised, with different reagents, which are further being reduced to corresponding flavan-4-ols. Attempts are being made to replace halogen atom by a hydroxy or by an acetoxy group and the stereochemistry involved is under study.

547.86

1279.574 Manjrekar, Tulsidas Gunvant. Structural problems concerning certain vat dyes and their intermediates. Bombay, National Chemical Laboratory, Poona, 1964-67. Venkataraman, K., Director (Retd.), National Chemical Laboratory, Poona.

Orientation problems concerning benzanthrones and violanthrones are being studied in the light of NMR spectra. The fragmentation pattern in the mass spectra of violanthrone derivatives is being studied as a new method of determining their structure. Reductive acetylation and methylation are being used for the isolation of vat dyes and their characterisation.

547.86

1280.575 Nayak, Ashutosh. Studies in some naphtha dyes. Utkal, Chemistry, 1966-69. Rout, Mahendra Kumar, Professor and Head of the Department.

Some paradialkylaminostyryl dyes and their aza analogues have been synthesised from naphthoxazole. The synthesis of dyes from substituted naphthathiozole is in progress. Some antispasmodic compounds have also been prepared from substituted xanthones, pyrimidines and pyridines by Mannich's reaction and their activities studied.

547.86

1281.576 Pati, Durga Charana. Influence of structural changes on absorption, sensitisation and rearrangement. Utkal, Chemistry, 1965-68. Rout, Mahendra Kumar, Professor and Head of the Department.

The effect of replacement of -CH-CH- by -CH=N- and -N=N- in dyes, derived from benzoxazoles and benzimidazoles, has been studied. Some diaza analogues, which may also be regarded as azo dyes, have been prepared to study their dyeing properties on synthetic fibres. Similar studies are also being carried out in naphthoxazole and naphthathiazole series. The effect of structural changes on semipinacolic deamination, Beckmann transformation and benzilic acid rearrangement is under investigation.

547.862

1282.577 Syed Mohammad Saleem. Electrode reactions in the presence of surfactants and dyes. Roorkee, Chemistry, 1966-67. Malik, Wahid-uddin, Professor and Head of the Department.

Physico-chemical studies on the micellar behaviour of non-ionic detergents have been carried out. Interaction of soaps and dyes is being investigated by polarographic and other methods. These studies have been taken up in view of the immense importance of dyes and detergents in textile industries.

547.86

Crystallography

Growth & Aggregation of Crystals

1283.578 Patel, Harmanbhai Bhailalbhai. Study of metal crystals. Baroda, Physics, 1963-65. Pandya, N. S., Professor and Head of the Department.

The single crystals of silver metal have been grown from the vapour phases and also electrolytically. These crystals have been subjected to chemical and thermal etching and their etch patterns studied. Work on study of micro structures of Cu-Ag eutectic alloys under different rates of cooling is in progress.

Thermal etch patterns on silver crystals. Curr. Sci. 34;1965 : p.689-690.

548.5

1284.579 Shukla, Ramesh Kamala Shanker. Studies of crystal surfaces. Baroda, Physics, 1965-67. Pandya, N. S., Professor and Head of the Department.

Factors influencing the growth of tin single crystals have been studied. The crystals have been grown from the melt using Bridgeman's method and the solid-liquid interface has been studied in detail. The work of chemical etching to reveal dislocation defects in these crystals is in progress.

548.5

Structural Crystallography

1285.580 Ambady, G. K. Studies on crystal structure analysis. Madras, Physics, 1962-66. Independently.

The molecular structure of some tartrates containing an increasing number of water molecules is being studied. For this purpose, sodium tartrate $2H_2O$, strontium tartrare $3H_2O$ and calcium tartrate $4H_2O$ have been chosen for study. The structures of all the three have been completely solved. A conformation analysis of active and meso forms of tartrates has also been carried out.

548.812

1286.581 Banerjee, Naba Kumar. Crystal structure of organic substances. I.I.T., Kharagpur, Physics & Meteorology, 1964-68. Mitra, G. B., Assoc. Professor.

The study of crystal structure of biguanide complexes is in progress.

The space groups of crystals of chloro-napthalene at different temperatures. Ind. Jour. Phys. 37;1963 : p.41

548.8

1287.582 Das, Birendranath. Crystal structure of organic compounds of biological interest. Calcutta, Pure Physics, 1964-68. Basak, B. S., Lecturer.

548.8

1288.583 Kalyanaraman, A. R. Studies on X-ray crystallography. Madras, Physics, 1963-67. Srinivasan, R., Professor.

A study of the structure of compounds of biological interest has been taken up by X-ray methods. The crystal structure studies on a purine complex and DL-ornithine are being carried out. Some theoretical work connected with the methods of analysis is also being done.

548.83

1289.584 Patel, Prabhudas Revandas. Influence of molecular structure on liquid crystalline properties and phase transitions in these structures. Baroda, Chemistry, 1963-65. Dave, J. S., Professor.

Different homologous series of alkoxy substituted Schiff's base compounds are being studied to investigate the influence of molecular structure on mesomorphism. Generally, with the increase in chain length, the nematic properties disappear giving rise to smectic properties. Binary systems comprising a smectic component are also under study.

(1) Ind. Jour. Chem. 2(4) ; 1964 : p.164 ; (2) Mol. Crys. 1 ; 1966 : p. 257-268 ; and (3) ibid. 1 ; 1966 : p. 269-277.

548.8

1290.585 Sastry, G. P. Crystal structure of organic substances. I. I. T., Kharagpur, Physics & Meteorology, 1965-69. Bose, H. N., Professor and Head of the Department.

The Chemical bonding, crystal structure, phase transitions, impurities and irradiation effects on crystals are being investigated. The molecular structure of some organic compounds will also be studied by nuclear resonance techniques.

548.8

1291.586 Thyagaraja Rao, S. Structural studies on organic compounds of biological importance. Madras, Physics, 1962-66. Ramachandran, G. N., Professor.

Crystal structures of the amino acid L-valine hydrochloride monohydrate and the dipeptides L-threonyl L-phenyl alanine p-nitro benzyl ester hydrobromide and D-l encyl glycine hydrobromide have been thoroughly established. In addition, the crystal structure of DL aspartic acid is also being reinvestigated. Many problems have been programmed for the electronic digital computer CDC 3600.

548.8

1292.587 Vasanth, Kunigahalli Lakshminarayanaiah. Influence of molecular structure on liquid crystalline properties and phase transitions in mixed liquid crystals. Baroda, Chemistry, 1963-65. Dave, J. S., Professor.

Binary systems comprising Schiff's base compounds, one or both of which may be non-liquid crystals, have been studied. A definite order of polarity of the end groups has been derived for mixed liquid crystal formation in the nematic phase.

548.8

1293.588 Bhattacharya, Satyananda. Structural defects in dehydrated products of kaolinite. I. I. T., Kharagpur, Physics & Meteorology, 1965-68. Mitra, G. B., Assoc. Professor.

Pure kaolinite samples from various sources have been collected and their chemical analysis and D. T. A. carried out. Samples have been dehydrated to different temperatures ranging from 100°C to 1000°C. X-ray photos are being taken and further investigations are in progress.

548.83

1294.589 Chacko, K. K. X-ray analysis of organic compounds. Madras, Physics, 1965-69. Srinivasan, R., Professor.

Crystal structure analysis of compounds of biological interest is in progress. A new single crystal diffractometer has been set up which will measure X-ray intensities more accurately than the usual photographic techniques.

548.83

1295.590 Chandrasekharan, R. Crystal structure of organic compounds of biological interest. Madras, Physics, 1962-66. Srinivasan, P., Professor.

The crystal structure analysis of Glucosamine hydrobromide and hydrochloride, Phenylene diamine dihydrochloride and N-methyl leucyl glycine hydrobromide has been carried out by X-ray methods. Theoretical results have been worked out for the correlation function connecting the observed and calculated structure factors when the latter do not necessarily include all the atoms in the structure. The results are being tested on hypothetical structures.

548.83

1296.591 Iyengar, Leela. Studies on thermal expansion, phase transformations and lattice defects by X-ray crystallographic methods. Osmania, Physics, 1964-69. Krishna Rao, Koppulu Venkata, Reader.

It has been observed by X-ray studies that vacancies created on heating tetragonal lead peroxide have a measurable effect on the lattice parameters and thermal expansion. A thorough quantitative study of the above phenomenon has now been undertaken supplementing the X-ray studies at each temperature by accurate density determinations. It is also intended to make a thorough investigation on similar crystals, like vanadium dioxide, manganese dioxide etc.

Curr. Sci. 35 ; 1966 : p. 80.

548.83

1297.592 Joseph, Jose. Studies in crystal physics. Gujarat, Physics, 1966-69. Pathak, P. D., Reader.

The different causes of the broadening of X-ray diffraction lines are being studied. This study will facilitate the measurement of the sizes of crystallites and lattice strains in powders of metals and alloys and investigation of relations among them.

548.83

1298.593 Kalyani, Venkatarama. X-ray crystallography. I. I. S., Bangalore, Physics, 1964-68. Krishnan, R. S., Professor.

The determination of the crystal and molecular structures of organic compounds containing lactone groups has been undertaken. Using X-ray diffraction methods, the structure of 3, 3′-di-(p-bromophenyl) -bi-3-phthalidyl has been elucidated by heavy atom method. The meso isomeric form of the compound has been established. The structure of p-bromophenyl phthalide is now being investigated.

Tet. Let. 44 ; 1966 : p.5413.

548.83

1299.594 Khan, M. Y. Crystal structure of organic molecules and co-ordination complexes by X-ray diffraction. Gorakhpur, Physics, 1964-68. Srivastava, P., Lecturer.

X-ray study of p-anisidine. Ind. Jour. Phys. 40 ; 1966 : p.271.

548.83

1300.595 Khawas, Bhagbat. X-ray analysis of the structure of para aceticanhydride crystals. Calcutta, Chemistry, 1964-67. Dhar, J., Professor, Mining Research Institute, Dhanbad.

548.83

1301.596 Lahiri, Barendranath. Determination of the crystal and molecular structure of organic compounds by the X-ray methods. Calcutta, Pure Physics, 1963-67. Basak, B. S., Lecturer.

548.83

1302.597 Michael, Alummoottil Joseph. Crystal physics. I. I. S., Bangalore, Physics, 1964-68. Krishnan, R. S., Professor.

The work is confined to the experimental investigation of the photoelastic behaviour of crystals. A sensitive equipment capable of detecting the extremely small changes in refractive index produced by an applied stress has been commissioned. Actual measurement yields the stress-optical and strain-optical constants of crystals.

548.83

1303.598 Misra, Nirmal Kumar. X-ray diffraction profile due to structure defects in some metals and alloys. I. I. T., Kharagpur, Physics & Meteorology, 1962-67. Mitra, G. B., Assoc. Professor.

Space group and unit cell dimension of biguanide acid sulphate have been determined. Theoretical investigation of thermal diffuse scattering for h. c. p. powders and effects of background on X-ray diffraction parameters have been carried out. A single line method of line shape analysis has been developed. Lattice defects in magnesium cadmium and Cu-Ni alloys have also been determined.

(1) Space group of biguanide acid sulphate. Z. Fur Kris. 119(1/2) ; 1963 : p.156 ; and (2) Background errors in X-ray diffraction parameters. Brit. JAP. 17 ; 1966 : p.1319.

548.83

1304.599 Misra, Yajyeshwar. Crystal structure of organic molecules and co-ordination complexes by X-rays diffraction. Gorakhpur, Physics, 1963-67. Srivastava, P., Lecturer.

The crystal structure of some organic molecules, viz., para-anisidine, quinalidie acid, 2-amino 5-chloro pyridine etc., is being investigated.

Ind. Jour. Phys. 40 ; 1966 : p. 271.

548.83

1305.600 Mohana Rao, Jejjala Krishna. X-ray crystallography. I.I.S., Bangalore, Physics, 1966-67. Krishnan, R. S., Professor.

It is proposed to study the crystal structures of ferroelectric crystals above and below the curie point. To begin with, the structure of glycine silver nitrate is being investigated. A tentative model of the structure obtained from the three dimensional fourier synthesis based on the phases of the heavy atom, silver, is being refined.

548.83

1306.601 Natarajan, Srinivasa. Some investigations in X-ray crystallography. I.I.T., Madras, Physics, 1965-68. Ramaseshan, S., Professor and Head of the Department.

Crystal structures of some organic and inorganic compounds are under investigation.

548.83

1307.602 Parthasarathy, S. Studies on crystal structures by the application of statistical methods. Madras, Physics, 1962-66. Ramachandran, G. N., Professor.

Theoretical studies, using mainly the theory of probability, are being made on the following problems in X-ray crystal structure analysis : (1) The probability distribution of Bijvoet differences, of phase angles, signs etc. ; (2) Higher moments of intensities to test for centro-symmetry and isomorphism ; and (3) Statistical distributions for testing isomorphism using intensity variables.

548.83

1308.603 Rai, Kailash Nath. Crystal physics. Banaras, Physics, 1966-68. P. Krishna, Reader.

The phase transformation in ZnS from cubic to hexagonal close-packed structure is being investigated. Single crystals of ZnS have been grown from vapour phase and heat-treated under controlled conditions and quenched The structural changes are being studied by single-crystal X-ray diffraction techniques to determine if polytypic structures result as intermediate states during the transformation.

548.83

1309.604 Sabesan, M. N. Studies in crystal structure analysis. Madras, Physics, 1965-69. Venkatesan, K., Reader.

An organic compound, suspected to contain a pyrozoline ring system, and dipeptide have been taken up for X-ray structure analysis. In the first compound, crystals with the heavy atom Br at para and meta positions, are being studied three dimensionally. The heavy atoms occupy special positions in both the cases which make the problem more complicated. The dipeptide taken up for structure analysis is L-proline L-phenylalanine O-methoxy hydrobromide. Work is in progress with this compound too.

548.83

1310.605 Satyanarayana Murty, Keta. Crystal structure determination by X-ray methods. Osmania, Physics, 1965-69. Krishna Rao, Koppulu Venkata, Reader.

Crystal structure studies of physiologically active organic compounds have been taken up. The unit cell dimensions and space group determination of 2-phenyl benzoxozole and formanilide have been made. Intensity data is being collected using Nonius Weissenberg camera. Structure refinement of some simple inorganic compounds, like mercuric chloride, has been taken up at different temperatures.

548.83

1311.606 Sengupta, Sibaprasad. X-ray diffraction study of metals and alloys. Calcutta, Chemistry, 1962-67. Srivastava, B. N., Professor, Ceramic Research Institute, Calcutta.

548.83

1312.607 Sequeira, Anisbert Stanislaus. Investigation in crystal structures. Bombay, Atomic Energy Establishment, Trombay, 1965-68. Iyengar, P. K., Head of the Division of Nuclear Physics, Atomic Energy Establishment, Trombay.

Neutron diffraction is a valuable supplement to the technique of X-ray diffraction in the study of crystal structure, especially in the case of solids containing light atoms, like hydrogen, in the lattice. A fully automatic neutron diffraction spectrometer is being constructed for collecting accurate intensities of Bragg reflections from small samples of single crystals. The analysed data reveal the positions of hydrogen atoms and these accurate measurements are interpreted towards the understanding of the hydrogen bond in various crystals.

548.83

1313.608 Srikrishnan, T. Studies on amino acids and peptides. Madras, Physics, 1964-68. Srinivasan, R., Professor.

The structure of the compound DL-histidine di-HCl has been studied. In addition, some theoretical studies concerning the application of statistics to X-ray crystallography have also been made.

548.83

1314.609 Srinivasan, V. Crystal structure by X-rays. Annamalai, Physics, 1965-68. Vijayaraghavan, K., Reader.

Detailed structure analysis of some organic crystals by X-ray methods is being done by taking Weissenberg photographs and studying the intensity of reflections. Theoretical discussions regarding the representation of space groups and crystallographic point groups will be taken up. Theoretical work pertaining to phase problem is also under consideration.

548.83

1315.610 Suryanarayana, Shambhuni Venkata. X-ray studies of crystals. Osmania, Physics, 1965-70. Deshpande, V. T., Reader.

A study of the lattice distortions, produced by cold work in hexagonal metals, from the analysis of the broadening of the powder diffraction lines has been undertaken employing a 11.46 Debye-Scheeret camera. It is expected to lead to interesting conclusions regarding the types of lattice distortions that are produced in close packed metals. A study of the thermal expansion of some crystals of Scheelite type has also been undertaken.

548.83

1316.611 Trivedi, J. M. Studies in crystal physics. Gujarat, Physics, 1966-69. Pathak, P. D., Reader.

A small furnace to be attached to the X-ray diffractometer is being constructed. The Debye temperatures of different metals and alloys will be taken and their vibration spectra studied.

548.83

1317.612 Vasavada, N. G. Studies in crystal physics. Gujarat, Physics, 1966-69. Pathak, P. D., Reader.

A small furnace to be attached to the X-ray diffractometer is being constructed. The thermal expansion of certain crystals at different temperatures will be measured and examined to find out whether there is any contribution of lattice defects to the thermal expansion.

548.83

1318.613 Vijayaraghavan, P. R. Neutron scattering and lattice vibrations. Bombay, Atomic Energy Establishment, Trombay, 1965-68. Iyengar, P. K., Head of the Division of Nuclear Physics, Atomic Energy Establishment, Trombay.

Using the technique of neutron scattering from crystals, it is possible to study the dynamical motion of atoms in a crystal. This involves a measurement of energy change of neutrons on scattering and the momentum change. A new type of instrument 'Multiarm spectrometer' has been constructed with very sophisticated electronic automation for its operation. Studies are in progress on hexagonal close packed type single crystals of magnesium, zinc and beryllium. The dispersion curves for phonons in definite directions in these crystals lead to a knowledge of interatomic forces, thermodynamical properties and behaviour of conduction electrons.

548.83

Mechanical Properties

1319.614 Anwarur Rahman. Studies on the elastic and photoelastic effects in crystals. Osmania, Physics, 1964-67. Iyengar, K. S., Professor and Head of the Department.

Elastic and photoelastic constants are being studied using dynamic as well as static techniques. The dispersion of photoelastic constants is also being studied in the ultraviolet region.

Dispersion of the strain optical ratios in cubic crystals. Acta Crys. 20(Pt. 1) : Jan. '66 : p.144-145.

548.842

1320.615 Hari Babu, V. Study of the defects in crystals. Osmania, Physics, 1964-67. Bansigir, K. G., Reader.

It is proposed to study the actual mechanism by which etch pits are developed at dislocation sites in sodium chloride crystals. The study of the change in the concentration of the poison and the effect of NaCl concentration in the etchant on the change in shape of the etch pits and dissolution rates provide good information to the theory of the etching.

548.842

1321.616 Krishnamurthi, S. S. Studies on the mechanical, thermal and electrical properties of some crystals. Ravishankar, Physics, 1965-68. Murty, T. S., Professor of Physics, Govt. Engg. College, Jabalpur.

Refinement of lattice dimensions of a molybdenite is being attempted on the basis of precision powder photographs using standardised extrapolation techniques. Thermal conductivity, perpendicular and parallel to the cleavage planes, has been studied and attempts are being made to evaluate carrier density based on difference between the two. Rectification characteristics of molybdenite metal junctions have also been studied by oscillographic methods and attempts are being made to explain the same.

548.84

1322.617 Mathai, Elizabeth. Study of metal crystals. Baroda, Physics, 1965-67. Pandya, N. S., Professor and Head of the Department.

The study of plastic deformation in zinc single crystals and order-disorder phenomena and phase transformation in alloys of zinc-cadmium and zinc-silver is being carried out. The single crystals of zinc have been obtained from melt by Bridgeman's method.

548.842

1323.618 Phatak, S. P. Pressure effects in ferroelectric $KNbO_3$. I. I. T., Kanpur, 1965-68. Subbarao, Eleswarapu China, Professor.

548.84

1324.619 Ram Kripal Singh. Lattice dynamics. Banaras, Physics, 1966-67. Verma, M. P., Lecturer.

It is proposed to study the elastic, optical and thermal properties of solids with special reference to the ionic crystals. A study of the different force models applied to the ionic crystals and the technique of calculations of the vibrational spectra and other properties has been completed.

548.84

Electrical, Electronic & Magnetic Properties

1325.620 Bhuniya, Ramchand. Electrical properties of alkali halides. I. I. T., Kharagpur, Physics & Meteorology, 1964-67. Chakravarty, B., Asstt. Professor.

The effects of anionic and cationic impurities, electrolytic colouration, X-ray radiation, thermal and optical bleaching of colour centres and quenching on the conductivity of KCl single crystal have been studied. The measurements of these effects on the dielectric properties are in progress.

548.85

1326.621 Datt, Suresh Chandra. Growth of single crystals of naphthalene and study of some electrical properties of naphthalene. Jabalpur, Physics, 1965-67. Nagchoudhuri, B. D., Director, Saha Institute of Nuclear Physics, Calcutta.

Naphthalene has been purified by vacuum sublimations, normal freezing and zone refining. Single crysals of naphthalene upto 3/4″ in diameter and 8″ in length have been grown by Bridgeman-Stockbarger method. These crystals are being used for studying electrical properties of naphthalene.

548.85

1327.622 Gon, H. B. Electronic properties of solids and allied problems. I. I. T., Kharagpur, Physics & Meteorology. 1964-68. Sharma, J., Asstt. Professor.

Potassium chloride crystals have been grown from melt by Stober's method with flakes of barium titanate embeded in them. Subjecting these crystals to electrostatic field, permanent dipoles have been set up in barium titanate crystals and colouration by X-rays has been studied.

548.85

1328.623 Harihara Iyer, Narayana. Investigations on some of the optical and magnetic properties of alkali sulphates. I. I. T., Madras, Physics, 1964-67. Sobhanadri, J., Lecturer.

It is proposed to study the optical and magnetic properties of sulphates with particular reference to alkali sulphates. Optical absorption studies have been made on single crystals of alkali sulphates irradiated with X-rays. Investigations are in progress on the study of colour centers. Measurements of magnetic susceptibility and electrical conductivity will also be done.

548.85

1329.624 Khan, Mohammad Aquil. Effect of temperatures on the piezoelectric materials. Indore, Mathematics, 1966-68. Paria, Gunadhar, Professor of Mathematics, G. S. T. Institute, Indore.

There are certain crystals, such as, quartz, which develop electrical energy when subjected to mechanical energy created in them by application of electrical fields. In the present study, a third field, namely, the temperature field has also been considered. It is proposed to determine the interacting effects of one field upon the other.

538.85

1330.625 Radhakrishnan. Magnetic resonance studies. I. I. S., Bangalore, Physics, 1965-69. Srinivasan, R., Lecturer.

The magnetic properties of certain transition ion complexes are being studied by the measurement of their magnetic susceptibilities and electron spin resonance spectra. These properties will be correlated with the optical absorption spectra of the complexes.

548.85

1331.626 Radhakrishna, S. Solid state physics. I. I. T., Delhi, Physics, 1966-68. Jain, S. C., Professor and Head of the Department.

Preliminary experiments have been completed on the study of electron paramagnetic resonance of alkali halides. Interesting results have been obtained.

548.85

1332.627 Ramasubba Reddy, Thettu. Investigations in electron paramagnetic resonance in solids. I.I.S., Bangalore, Physics, 1962-67. Srinivasan, R., Lecturer.

The electron paramagnetic resonance technique has been applied to the paramagnetic ion in some metallo-organic complexes to investigate the binding of various types of ligands, like oxygen, nitrogen, sulphur and selenium. A 100 kc/s magnetic field modulation, X-band reflection type EPR spectrometer has been constructed for this purpose.

548.85

1333.628 Rangarajan, Gopalan. Magnetic resonance in solids. I.I.S., Bangalore, Physics, 1964-68. Srinivasan, R., Lecturer.

Using a Pound-Knight absorption spectrometer, nuclear magnetic resonances in solids are being studied.

These investigations include the study of (i) the structure of water molecules in hydrated crystals ; (ii) the motion of groups containing protons and fluorines in crystals ; and (iii) the hyperfine interactions in paramagnetic crystals.

548.85

1334.629 Salhotra, Prem Prakash. Phase transitions in $RbNO_3$. I.I.T., Kanpur, Physics, 1965-67. Subbarao, Eleswarapu China, Professor.

548.85

1335.630 Seethalakshmy, Subramanya. Magnetism. I.I.S., Bangalore, Physics, 1961-67. Srinivasan, R., Lecturer.

A wide line Nuclear Magnetic Resonance Spectrometer has been constructed to study the structure of water molecules in hydrated crystals. Some hydrated metal acetate, formate crystals have been grown and are being investigated.

548.85

1336.631 Sharma, Bhikam Lal. Electrical and magnetic properties of copper sulphate crystals. Ravishankar, Physics, 1966-69. Das, J. N., Professor of Physics, Science College, Raipur.

The research deals with (1) Growth of single crystals from solution ; (2) D. T. A. graph and determination of temperatures at which water of crystallization is lost and any structural changes ; (3) Electrical conductance and capacitance with frequency at room temperature ; (4) Variation of above with temperature ; (5) Pyroelectric effect ; (6) Magnetic properties and variation with temperature ; and (7) Effect of impurities.

548.85

1337.632 Srinivasan, Thirumalai Parthasarthy. Some studies in crystal physics. I.I.T., Madras, Physics, 1965-68. Ramaseshan, S., Professor and Head of the Department.

Tensor character of magnetio-optical properties of dielectric and metallic crystals is being investigated.

548.85

1338.633 Subramanyam, A. V. Magnetic and galvanomagnetic properties of copper-nickel alloys. I. I. T., Kharagpur, Physics & Meteorology, 1964-68. Duttaroy, S. K., Asstt. Professor.

Magnetic susceptibilities, resistivity and Hall coefficient of copper-nickel alloys have been measured from 80°k to 800°k at various concentrations. Attempts are being made to explain the extraordinary Hall coefficient in ferromagnetic alloys by means of spin orbit interaction between non-polarized conduction electrons and spin system of the ferromagnetic alloys.

548.85

1339.634 Unnikrishnan Nair, Velu Nair. Nuclear magnetic resonance spectroscopy of some organic compounds. Kerala, Physics, 1965-68. Aruldhas, G., Lecturer.

The analysis of NMR spectrum of epichlorohydrin taken at 100 mc/s has been carried out and the parameters determined. The analysis of the NMR spectra of certain amino acids, viz., valine, β-hydroxy valine, isovaline and allothreonine is in progress.

548.85

1340.635 Verma, Ram Das. Semi-conducting properties of Galena crystals of Indian origin with a view to obtain tunnel diode action in them. Ravishankar, Physics, 1966-69. Das, J. N., Professor of Physics, Science College, Raipur.

The research deals with (1) Electrical conductivity with temperature to determine width of energy gap; (2) Hall effect measurement to determine carrier concentration and mobility; (3) Thermoelectric power measurement; and (4) Localised heat treatment in H_2S atmosphere to create p-n junction for tunnel diode action and its study.

548.85

Thermal Properties

1341.636 Devanarayanan, Sankaranarayana. Ferroelectric crystals and their properties. I.I.S., Bangalore, Physics, 1963-68. Narayanan, P. S., Asstt. Professor.

Thermal properties of crystals are related to their other physical properties, such as, the vibration spectrum, ferroelectricity etc. The thermal expansion of anisotropic crystals, especially those exhibiting ferroelectric properties, is being investigated precisely at different temperatures and during phase transitions. Growth of crystals by artificial methods and domain structure of ferroelectrics also form part of the investigation.

548.86

Optical Crystallography

1342.637 Joshi, Thakorbhai Ramchandra. Optical properties of impurity doped ionic solids. Baroda, Physics, 1965-67. Joshi, R. V., Professor.

Investigation of thermoluminescence of pure and thallium activated NaCl specimens after being subjected to various pretreatments, has been undertaken to get detailed information about the nature and characteristics of the various trapping sites involved in the luminescence of the phosphor. It is hoped that the work may enhance the understanding of the colouration phenomena and the role of dislocations in alkali halides.

548.9

1343.638 Mathews, P. P. Optical bleaching studies of pure and doped alkali halide crystals. Baroda, Physics, 1965-67. Joshi, R. V., Professor.

It has earlier been suggested that the various glow peaks exhibited by the KCl : Tl system correspond to the thermal bleaching of different species of colour centers in the lattice. The effect of optical illumination with light of wavelength corresponding to the absorption bands of various colour centres on the thermal glow peaks of phosphors has been studied in the light of the suggested hypothesis. The results obtained are being analysed.

548.9

1344.639 Ranga Rao, D. Optical and allied properties of CaF_2 excited by cathode rays. I.I.T., Kharagpur, Physics & Meteorology, 1963-67. Bose, H. N., Professor and Head of the Department.

Pure synthetic calcium fluoride crystals (supplied from Harshaw Chemical Co., U.S.A.) have been coloured by low energy cathode rays (10kv) at different temperatures. Optical absorption of the coloured samples has been measured at room temperature in all the cases. Studies on the cathode-luminescence spectra, long period afterglow decay and thermoluminescence of these crystals are in progress.

548.9

1345.640 Shah, Shashikant Vandravan. Optical and related properties of alkali halides. Baroda, Physics, 1963-66. Joshi, R. V., Professor.

Luminescent measurements of alkali halides activated with divalent impurities have been made. These have revealed the nature of trapping sites and the mechanism by which recombination takes place in such phosphors. The thermoluminescence peaks in sodium chloride doped with strontium can be explained on the basis of certain species of colour centers, like F, Z and their higher aggregates.

548.9

1346.641 Sinha, Hareshwar Dayal. Electroluminescence of doped and mixed crystals. Patna, Physics, 1965-68. Verma, M. N., Professor and Head of the Department.

Some crystals, when kept in high D. C. field or H.F. A.C. field, emit light. This is called cold emission. Cold emission of certain crystals doped in fluorescence is being studied. The light output is measured by a photomultiplier tube connected with a ballastic galvanometer or cathodray tube.

548.9

1347.642 Thakar, Badrinarayan Bhailalbhai. Optical studies on crystal surfaces. Baroda, Physics, 1963-66. Pandya, N. S., Professor and Head of the Department.

The influence of basic physical parameters, such as, growth rate, temperature gradient, impurities etc., on the growth and orientation of the single crystals of antimony has been studied in detail. The dislocation type defects have been studied by chemical etching as well as by thermal etching. The confirmation about the correspondence between etch pit and dislocation has been made.

548.9

For Geochemistry

See

GEOLOGY

EARTH SCIENCES

Mineralogy

1348.1 Ghosh, Anilkumar. Mineralisation in relation to stratigraphy, structure and igneous action. Calcutta, Geology, 1963-67. Banerjee, A. K., Professor of Geology, Presidency College, Calcutta.

549

Determinative Mineralogy

1349.2 Keshari, Narain Das. Sedimentology and mineralogy of L. Vindhyans around Bhaunathpur, Bihar. Banaras, Geology, 1965-67. Bhattacharya, A. K., Reader.

The barytes and martite minerals will be investigated mineralogically and chemically to throw light on their genesis along with the host sedimentary and penecontemporaneous volcanic rocks.

549.1145

Physical & Chemical Mineralogy

1350.3 Debsikdar, Jagadish Chandra. Identification and estimation of minerals by thermo-grenisentric analysis. Calcutta, Geology, 1963-67. Lahiri, Durgadas, Reader in Applied Chemistry.

549.133

1351.4 Vanka Prasad. Some aspects of rock magnetism as related to magnetic prospecting. Osmania, Geology, 1964-67. Bhimasankaram, Vemu Lakshminarayana Subramanya, Reader.

Oriented samples of basalts have been extensively collected from the Deccan traps of Aurangabad District, Maharashtra, for magnetic and paleomagnetic studies and their directions of magnetisation have been observed. A rotating head magnetometer, A. C. demagnetising instrument and a magnetic hysteresis apparatus have been constructed for these studies The construction of instruments for magnetic studies at high temperature is in progress.

549.127

Specific Minerals

Metals

1352.5 Ghosh, Prakaschandra. Investigation on the geology of the eastern parts of Purulia and adjoining parts of Bankura District, West Bengal, with special reference to the metallic mineral deposits. Calcutta, Geology, 1963-68. Chatterjee, N. N., Professor (Retd.).

549.23

1353.6 Narasimha Reddy, Muppa. Mineragraphic studies of copper ores of Agnigundala and Mailaram. Osmania, Geology, 1966-69. Ramana Rao, Nunna, Lecturer.

549.23

Oxides

1354.7 Abbas, Sayed Asgar. Bauxite deposits of Jammu and Kashmir State. Roorkee, Geology, 1964-67. Mithal, Rajendra Singh, Professor and Head of the Department.

Field mapping and extensive sampling of the bauxite deposits has been carried out. Chemical analysis of the bauxite samples from Salal has also been done. Point diagram has been prepared to classify the bauxites into different types. Petrological and differential thermal analyses of bauxites are in progress.

549.53

1355.8 Daga, Hanumandas Mathuradas. Studies in complex metal oxide systems. Nagpur, Chemistry, 1965-68. Deshpande, V. V., Professor.

The research has been undertaken on the crystal chemistry of Franklinite. It has the general formula $R''R_2'''O_4$. (Fe, Mn, Zn) (Fe, Mn)O_4. Attempts are being made to prepare the mineral synthetically by heating composite oxide mixtures in the correct proportion at a high temperature. The temperatures at present used for heating the samples vary between 800° to 1400°C. Slow cooling as also quenching techniques are being employed to ascertain the complete reaction.

549.526

1356.9 Garg, Ramesh Chandra. Physico-chemical aspects of the interaction of some inorganic oxides and spinels in solid state. Banaras, Silicate Technology, 1966-69. Samaddar, B. N., Head of the Department.

The ferrosoferric spinel formation at different temperatures has been studied. Method of estimation of ferrous iron is being established for sintered ferrite specimens.

549.526

1357.10 Mukherjee, Subodhgopal. Interaction of oxides. Banaras, Silicate Technology, 1965-66. Samaddar, B. N., Head of the Department.

The behaviour of co-precipitated magnesium and aluminium hydroxides has been studied on heating upto 1350°C. The lowest temperature of interaction was 850°C. Attempt has been made to establish the structure of the co-precipitate by D. T. A., D. T. G. A., infrared spectroscopy and X-ray diffraction.

Trans. ICS. 25(1) ; 1966 : p. 33-34.

549.53

1358.11 Nair, Gopalakrishnan. Geology and associated chromite deposits of Pauni area, Bhandara District, Maharashtra, Roorkee, Geology, 1963-66. Krishna Kant Singh, Reader.

Field work has been completed and the laboratory studies point to a new discovery of verniculite deposits.

549.526

1359.12 Narayanan, Sampath. Geophysical investigations on hematite bearing area of Veldurthi, Kurnool District, A. P. Osmania, Geology, 1962-67. Bhimasankaram, Vemu Lakshminarayana Subramanya, Reader.

Laboratory work comprising X-ray studies, paleomagnetic directions, susceptibility measurements, magnetic separation and chemical analysis on the samples collected from the Veldurthi area is in progress.

549.523

1360.13 Rama Rao, Kanakapalli. Structural studies in complex metal oxide systems—columbite. Nagpur, Chemistry, 1965-68. Deshpande, V. V., Professor.

The mineral columbite has the general formula (Fe, Mn) $(Nb,Ta)O_6$. It has been prepared synthetically by heating the composite oxide mixtures in the right proportion. The X-ray powder photograph of the sample has shown it to be identical with the photograph of the natural mineral. Attempts are being made to substitute Fe and Nb ions by other suitable ions of comparable size to determine the extent of solid solution formation.

549.528

Silicates

1361.14 Naidu, P. Tirupati. Mineralogy of calc-silicate rocks of Andhra Pradesh. Venkateswara, Geology, 1963-67. Suryanarayana, K. V., Reader.

Calc-silicate rocks are metamorphosed impure siliceous limestones, which consisted originally of calcite, dolomite, quartz and clay minerals in variable amounts. Chemically, these rocks are characterised by containing excess CaO over the sum of MgO and FeO and general richness in silica. These rocks represent one of the khondalite series and occur as scattered, isolated outcrops amidst the other members of the khondalite series, prophyritic-feldspar gneisses charnockites series of rocks and leptynites.

Ferroan calcite-dahllite-schorl assemblage near Kanigiri, Nellore District, A. P. Ind. Mint. 5(2); 1964 : p.91-94.

549.6

1362.15 Rai, Awadhesh. Detailed mineralogical and petrological study of the mica bearing pegmatities of Hazaribagh District, Bihar. Banaras, Geology, 1965-67. Mukherjee, N. K., Reader.

The mica bearing pegmatites of India are a very important group of rocks which have given rise to very rich deposits of mica. The study of the underground structure and geochemical behaviour of these rocks is being pursued.

549.67

1363.16 Saxena, Santveer Kumar. Detailed study of the different heavy mineral deposits along the coastal tracts of India. Banaras, Geology, 1966-68. Mukherjee, N. K., Reader.

Along the east and west coasts of India, there are several concentrations of heavy mineral deposits in which ilmenite, magnetite, rutile, zircon, monazite, garnets etc., are found. These have vast economic potentialities. The original country-rocks and reserves of such important mineral deposits are being assessed.

549.62

Geology

1364.17 Srivastava, Ghan Shyam. Application of the numerical methods in geology. I. I. T., Kharagpur, Geology & Geophysics, 1966-68. Rao, S. V. L. N., Asstt. Professor.

Geological data is being processed with the high speed electronic computer to evaluate the computer capability in the various fields of geology. Statistical methods, such as, multivariate analysis, linear discriminate function, distant function, vectorial data analysis as used in structural geology, testing of orientation data etc., have been programmed. Besides these, various programmes have been modified to suit the needs of present research as well as those of 1620 IBM 40K unit.

551

Earth and its structure

1365.18 Verma, Om Prakash. Model experiments simulating the conditions encountered when applying electromagnetic methods to the problems of engineering and prospecting. Roorkee, Geology, 1963-67. Gaur, Vinod Kumar, Reader.

The assembly of the equipment required to measure the electromagnetic response of buried geological structures on a reduced scale model has been completed. The measuring instruments have also been calibrated and the proposed measurements are being taken.

551.11

Earthquakes

1366.19 Chauhan, Ram Kishore Singh. Measurement of magnetic and elastic anomalies in seismically disturbed regions. Roorkee, Geology, 1965-67. Gaur, Vinod Kumar, Reader.

Strain rebound studies of several regions of Northern India have been completed and these have produced some interesting results. Further work along these lines and also on instrumentation is in progress.

551.22

1367.20 Khade, Bhalchandra Bhaskar. Some aspects of explosion seismology and low magnitude natural earth tremors. Poona, Central Water & Power Research Station, Poona, 1965-67. Banerjee, Santi Lal, Chief Research Officer, Geophysics, Central Water & Power Research Station, Poona.

Elastic wave spectra from shallow underground explosions and low magnitude natural earth tremors are being studied. The spectra recorded by electromagnetic and mechanical seismographs have been theoretically interpreted in respect of immediate geological strata, magnitude of explosion, depth of foci and distance between centres of explosions and points of observations.

551.22

1368.21 Patangay, Nandishwar. Acad Riznichenko's method of statistical analysis of earthquakes with respect to seismic zoning of India and neighbourhood. Osmania, Geology, 1966-68. Bhimasankaram, Vemu Lakshminarayana Subramanya, Reader.

The data of earthquakes occurring in India and neighbourhood has been collected for few years and graphs between the number of earthquakes and their energy class have been drawn.

551.22

1369.22 Ray, Arabinda. Theoretical seismology. Calcutta, Geology, 1963-67. Chakrabarti, S. K., Professor, Applied Mathematics.

551.22

1370.23 Sen Gupta, Saradindu. Analysis of surface waves in the vicinity of small explosions. I.I.T., Kharagpur, Geology & Geophysics, 1965-67. Ganguli, D. K., Asstt. Professor.

Ground rolls in aluvium generated by explosions, as used in regular prospecting, are being analysed. This will help improve the signal (reflected body wave) to noise (surface wave) ratio.

551.22

1371.24 Umesh Chandra. Attenuation of seismic waves in different kinds of solids. Roorkee, Geology, 1963-67. Gaur, Vinod Kumar, Reader.

Formal solutions for some hitherto unsolved two layered cases have been obtained. Radiation patterns for arbitrary stress directions and for different values of the Poisson's ratio have also been computed.

551.22

See Also

PHYSICS, SOUND

Sedimentation

1372.25 Bhargava, Manjeet. Sedimentological studies of Vindhyans as exposed around Sidhi, M. P. Banaras, Geology, 1965-67. Bhattacharya, A. K., Reader.

The study will be mainly of combined field and laboratory type, with the ultimate aim of elucidating the environmental conditions of sedimentation.

551.303

Geomorphology

1373.26 Kulshreshtha, Suresh Chandra. A geomorphological study of Mysore-Kerala area. Aligarh, Geology, 1965-68. F. Ahmad, Professor and Head of the Department.

551.4

Oceanography

1374.27 Dey, Balaram. Influence of topography on land use in West Bengal. I. I. T., Kharagpur, Geology & Geophysics, 1966-69. Niyogi, Dipankar, Asstt. Professor.

Topography and climate are the main controlling factors in land use. No detailed work on land use has so far been done in West Bengal. The work on land use, now in progress, will help the cultivators to divide the fields according to the suitability of crops.

551.46084

1375.28 Hukku, Mira. Coastal geomorphology of India. Calcutta, Geology, 1965-67. Chatterjee, S. P., Professor of Geography. (Retd.).

551.46

1376.29 Sankaranarayanan, Venganellore Narayanaswamy. Studies on nutrients in relation to physical features of backwaters and coastal upwelling. Kerala, National Institute of Oceanography, New Delhi, 1965-68. Varadachari, V. V. R., Scientist, Physical Oceanography Division, National Institute of Oceanography, New Delhi.

Studies on the distribution of nutrients in the coastal regions and in the backwaters from marine to freshwater zone at Cochin in relation to coastal upwelling and some hydrographical features of the backwaters have been undertaken, The investigation will help an assessment of the productivity of the coastal regions and backwaters.

551.4609

1377.30 Satyanarayana Murty, Chimalapati. Inshore circulation system along the Kerala Coast. Kerala, National Institute of Oceanography, New Delhi, 1964-68. Varadachari, V. V. R., Scientist, Physical Oceanography Division, National Institute of Oceanography, New Delhi.

Studies on littoral and coastal currents and their effect on coastal erosion and sedimentation along the Kerala Coast have been undertaken. A suitable float for the study of inshore circulation has been designed. The study is expected to provide an insight into the nature of beach erosion processes along the Kerala Coast.

551.4701

Surface Waters

1378.31 Bhattacharya, Asis Kumar. Geomorphology and sedimentation along the lower reaches of the river Baitarani, Orissa. I. I. T., Kharagpur, Geology & Geophysics, 1966-69. Niyogi, Dipankar, Asstt. Professor.

The lower reaches of the river Baitarani will be studied to throw light on the history of sedimentology, the evolution and the sedimentological characters of the geomorphic units. The deltaic portion of the river will also be studied.

551.483

1379.32 Ghosh, Swapan Kr. Geology of Bengal Basin. I. I. T., Kharagpur, Geology & Geophysics, 1966-69. Niyogi, Dipankar, Asstt. Professor.

An attempt is being made to form a new geologic map of Bengal on the basis of airphotographs and the field work.

551.483

1380.33 Khan, Rashid Ali. Geology of the Lower Gondwana in Satpura Basin. Aligarh, Geology, 1966-69. F. Ahmad, Professor and Head of the Department.

551.483

1381.34 Madhava Rao, D. Sedimentation pattern of Kurnool system of sediments in Cuddapah Basin, Andhra Pradesh. Venkateswara, I. I. T., Kanpur, 1966-69. Gokhale, K. V. G. K., Asstt. Professor of Geology, I. I. T., Kanpur.

Tectonic framework and environments of sedimentation alongwith the geological framework for Kurnool system of sediments are being worked out on the basis of the field and laboratory investigations.

551.483

1382.35 Pawan Kumar. Geology of the Vindhyan Basin of Western Rajasthan. Aligarh, Geology, 1966-69. F. Ahmad, Professor and Head of the Department.

551.483

1383.36 Sarkar, Swapan Kumar. Origin of Bengal Basin. I. I. T., Kharagpur, Geology & Geophysics, 1966-69. Niyogi, Dipankar, Asstt. Professor.

Bengal as a whole has been divided into certain geomorphic zones and the geomorphic zones have been further subdivided into number of facets i. e. pieces of land having homogeneous character. Samples have been collected from each facet and their sedimentological character is being studied in the laboratory.

551.483

1384.37 Siddiqi, M. Salamuddin. Geology of the Narmada Basin. Aligarh, Geology, 1965-68. Pant, I. D., Lecturer.

551.483

Meteorology

1385.38 Daggupaty, Sree Rammurthy. Instability of tropical zonal currents. Poona, Physics, 1964-67. Pisharoty, P. R., Director, Institute of Tropical Meteorology, Poona.

Numerical models have been designed for the study of synoptic scale disturbances in the tropical region. The phenomenon of instability, both in baroclinic and barotropic cases, has been explained in terms of the energetics of zonal mean and perturbation motions. Instability properties of the large scale baroclinic disturbances in tropics are found to be significantly different from those of the middle lattitudes.

551.55

1386.39 Deshpande, Dinkar Vishwanath. Study of jet streams. Bombay, Institute of Tropical Meteorology, Poona, 1963-68. Pisharoty, P. R., Director, Institute of Tropical Meteorology, Poona.

Considerable upper air data regarding the subtropical and easterly jet streams has been obtained in India during the last decade through upper air soundings and aircraft reports. These are being analysed to obtain their implications in the development of weather phenomena.

551.5187

1387.40 Gupta, Shashi Kumar. Investigation of the upper atmosphere. Allahabad, Applied physics, 1963-68. Ghosh, Satyendra Nath, Professor and Head of the Department.

Chemiluminescent reactions between active nitrogen and some organic chemicals are being studied. Theoretically, distribution of ionic and excited atomic species, which give rise to day airglow radiation has been calculated. Relation between solar cycle and some airglow radiations has also been investigated.

551.514

1388.41 Jain, Santosh Kumar. Study of certain atomic reactions. Allahabad, Applied Physics, 1962-67. Ghosh, Satyendra Nath, Professor and Head of the Department.

A study of the gaseous phase atomic reactions in a dynamic flow system has been undertaken. The reaction of active nitrogen with methylene chloride is being studied. This will help analyse some upper atmospheric processes.

Brit. JAP. 71 ; 1966 : p.757-759.

551.5

1389.42 Kelkar, Ranjan Ratnakar. Role of radiation in atmospheric circulation. Poona, Physics, 1966-69. Jagannathan, P., Asstt. Director, Institute of Tropical Meteorology, Poona.

A numerical experiment will be carried out with an atmospheric model to study the effect of a change in radiational heating on the mean motion. This will be done by varying the parameters affecting radiation, such as, atmospheric absorption, cloud amount, earth's albedo etc.

551.5273

1390.43 Kukreja, Prem Bhushan. Ozone and stratospheric patterns. Banaras, Geophysics, 1965-67. Rathor, H. S., Professor and Head of the Department.

The observations for determination of extra terrestrial constants have been taken. Cloud charts for ozone amount calculation in cloudy sky have been prepared. The total ozone amount and vertical distribution of ozone data of the world for 1964-66 are under investigation with particular reference to Varanasi.

551.5112

1391.44 Ramakrishnan, A.R. Perturbations in the general circulation over India and neighbourhood. Poona, Meteorological Office, Poona, 1963-68. Ananthakrishnan, R., Deputy Director General of Observatories (Forecasting), Poona.

The general circulation over India and neighbourhood is characterised by well defined seasonal changes and large scale perturbations in the seasonal patterns. The nature of the perturbations as well as circulation features associated with the onset and withdrawal of monsoon are being studied.

551.517

1392.45 Ramji. Atmospheric ozone and related atmospheric and weather phenomena. Banaras, Geophysics, 1966-68. Rathor, H. S., Professor and Head of the Department.

A series of ozone observations, both for total amount and for vertical distribution, have been taken with the help of Dobson's ozone spectrophotometer. The data is being analysed for correlating it with synoptic situations and various weather phenomena.

551.5112

1393.46 Redkar, Ramkrishna Tukaram. High altitude measurements using balloon techniques. Bombay, Tata Institute of Fundamental Research, Bombay, 1961-67. Gokhale, Gajanan Shridhar, Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

Considerable work has been done on extrusion of quality controlled coloured polyethylene film, major hurdle at our latitudes being brittle fracture due to low temperatures of —85°C at the tropopause, and design and manufacture of balloons reaching stratospheric altitudes. Wind data upto 37 km., obtained during 1957-66, has been analysed and interesting features revealed, parti-

cularly at stratospheric altitudes for which the data over India is meagre.

551.5142

1394.47 Shirwaikar, Vassant Vishnu. Studies in micrometeorology. Bombay, Tata Institute of Fundamental Research, Bombay, 1964-68. Gokhale, Gajanan Shridhar, Assoc. Professor, Tata Institute of Fundamental Research, Bombay.

A theoretical study of diurnal variation of wind profile in friction layer using large diurnal variations of eddy diffusivity, assumed to be constant with height, has been made. Temporal change in temperature profile near ground due to radiational heat transfer is being studied.

551.517

1395.48 Shukla, Radha Vishnu. Investigations on atmospheric physics. Allahabad, Applied Physics, 1963-68. Ghosh, Satyendra Nath, Professor and Head of the Department.

The study of chemiluminescent reactions between the neutral particles giving an understanding of the excitation mechanism and height of emitting layer of the particles responsible for such reactions has been undertaken. The reactions between sodium and oxygen atoms and between nitric oxide and O atoms have been investigated. Work is in progress for the reaction between lithium and oxygen atoms.

551.5

Atmospheric Electricity & Optics

1396.49 Banerji, Santosh Kumar. Investigations in atmospheric physics. Allahabad, Applied Physics, 1966-69. Ghosh, Satyendra Nath, Professor and Head of the Department.

Theoretical studies are being made of hydrogen radiation in night sky.

551.566

1397.50 Dhar, Niharchandra. Studies of atmospherics and atmospheric electricity. Calcutta, Geology, 1964-67. Khastgir, S. R., Professor of Physics, Bose Institute, Calcutta.

551.56

1398.51 Selvam, Mary. Investigation in cloud physics and thunderstorm electricity. Poona, Physics, 1965-68. Krishnan, M. V. Sivarama, Meterologist, Office of the Deputy Director General of Observatories, Poona.

Investigation of cloud electrification in the tropics has been taken up by measurement of air earth current, potential gradient, point discharge current and rain charge with special reference to thunderstorm electricity.

Applications of satellite cloud pictures are being studied to determine the central position of tropical cyclone as also to evaluate the maximum surface wind speed.

551.563

1399.52 Srivastava, Awadh Narain. Photometric and spectroscopic studies of certain upper atmospheric reactions. Allahabad, Applied Physics, 1963-67. Ghosh, Satyendra Nath, Professor and Head of the Department.

Upper atmospheric atomic and molecular reactions leading to night airglow have been simulated in the laboratory in a dynamical flow system. Such reactions have been studied spectroscopically as well as photometrically. Investigations will be useful in developing rocket fuels.

551.56

1400.53 Tillu, Arun Damodar. Twilight and airglow studies at Poona. Poona, Physics, 1961-66. Chiplonkar, M. W., Professor and Head of the Department.

Photometric observations of the airglow in eight different colours have been used to study the space-time variations of intensity, correlations and height estimations. Twilight observations have been utilized to obtain temperatures in upper atmosphere. Brightness of the zodiacal light has also been estimated.

(1) IJPAP. 3 ; 1965 : p. 182, 358 ; (2) ibid. 4 ; 1966 : p. 32 ; and (3) Ind. Jour. Met. Geophys. 17 ; 1966 : p. 95.

551.566

Hydrometeorology

1401.54 Chorghade, S. L. Role of upper winds in the formation of fog and low clouds. Poona, Meteorological Office, Poona, 1964-66. Pisharoty, P. R., Director. Institute of Tropical Meteorology, Poona.

Presenting an entirely new approach to the problem of forecasting of fog, this investigation seeks to show that observations on veering or backing of local upper winds with height in the lowermost layers of the atmosphere together with the critical appreciation of the associated synoptic situations, give a positive and helpful indication of the impending occurence of fog and can be used as a dependable method of forecasting of fog. Several cases where such upper wind observations actually helped the forecasting of fog at important aerodromes in India have been studied.

(1) Hydrometeorology. Bhagirath. 11(4); Oct. '64 :

p. 137-141 ; and (2) Precipitation at Nagpur (India). Bull. AMS. 46(7) ; July '65 : p. 410-411.

551.575

1402.55 Gopal Das. Special features of rainfall in India. Banaras, Geophysics, 1966-68. Rathor, H. S., Professor and Head of the Department.

551.5781254

Climatology & Weather

1403.56 Thiruvengadathan, A. Studies on some aspects of wind and pressure fields at low latitudes. Poona, Meteorological Office, Poona, 1964-68. Ananthakrishnan, R., Deputy Director General of Observatories (Forecasting), Poona.

Nature. 205(4967) ; Jan. 9, 1965 : p. 166-167.

551.644

Stratigraphy

1404.57 Adyalkar, Pandurang Ganpatrao. Palaeogeography, framework of sedimentation and groundwater potentiality of the upland alluvial basins of India. Nagpur, Geological Survey of India, Calcutta, 1965-68. Independently.

The research work comprises collection and compilation of tubewell data in respect of the past drilling activities in the upland and faulted alluvial valleys of India, namely, of Narmada, Tapti and Purna rivers, and interpretation of the data in the light of the available topographical, geological and hydrological information on record.

Proc. NIS. 29A (1) ; 1963 : p.25-45.

551.7

1405.58 Chadha, Satish Kumar. Geology of the country in and around Muttal in Jammu Province. Jammu & Kashmir, Geology, 1966-69. Wakhloo, Shambu Nath, Professor and Head of the Department.

The great limestone inlier at Katra and Jangalgali forms an important stratigraphic and structural unit in the Jammu Himalayas. These are of considerable economic importance not only because of the presence of a thin coat of bauxite deposits but also because of the presence of eocene coal-bearing formation fringing around it. Besides the area is of considerable importance from a geomorphological point of view as huge blankets of pleistocene glacial terraces cover the various valleys bordering the Trikuta hill ranges. The study is primarily devoted to the stratigraphic and geomorphological aspects of the area.

551.7

1406.59 Dhar, Bhushan Lal. Geology of the area in and around Kistwar falling between latitudes 33°-15′ to 33°-35′ N and longitudes 75°-30′ to 75°-50′ E. Jammu & Kashmir, Geology, 1966-69. Wakhloo, Shambu Nath, Professor and Head of the Department.

The Kistwar area provides an important geological field for the study of tectonics, petrogenesis and stratigraphy of the pre-cambrian formation. It is found that the area comprises mostly of metamorphic rocks viz. slates, phyllites, schists, gneisses, migmatites, quartzites and limestones, all included under Salkhala series. A detailed paragenetic study of these and closely allied rocks is being pursued.

551.7

1407.60 Gandotra, Krishan Lal. Geology of the section of the Pir Panjal Range enclosed between latitudes 33°-25′ to 33°-40′ N and longitudes 75°-10′ to 75°-30′ E. Jammu & Kashmir, Geology, 1965-68. Wakhloo, Shambu Nath, Professor and Head of the Department.

This region in Kashmir is of considerable stratigraphic and tectonic interest. The huge overturned anticline composed of various palaeozoic rock formations constitute the main part of the Pir Panjal Range in Banihal. The stratigraphic succession in this and the adjoining areas ranging from the pre-cambrian Dogra slates to the fossiliferous Jurassics history is being carried out.

551.7

1408.61 Kachroo, Kul Bhushan, Geology of the area in between latitudes 40°-0′ to 34°-15′ N and longitudes 74°-30′ E. Jammu & Kashmir, Geology, 1965-68. Wakhloo, Shambu Nath, Professor and Head of the Department.

The western part of Pir Panjal Range is of great stratigraphic interest. The Panjal volcanics, which constitute the most important stratigraphic unit, are associated with the metamorphics, namely, the Salkhalas series and Dogra slates and the Tanawals, the age of which is still controversial. The Gulmarg region is especially of much importance because of the presence of Gondwana plant bearing beds in association with the Tanawals. Their stratigraphic position viz-a-viz the plant beds is of considerable importance. The study is directed at working out the stratigraphy on the palaeontological and other grounds.

551.7

1409.62 Prabhandam Prakash. Studies on the stratigraphy, structure and metamorphism of the Pakhals in the south-eastern parts of the Pakhal Basin, A. P. Osmania, Geology, 1965-68. Janaradan Rao, Yerramilli, Professor and Head of the Department.

The structural and metamorphic aspects of the basin are being studied to arrive at the metamorphic history of the Pakhals and the tectonic activity to which these have been subjected.

551.7

1410.63 Sarkar, Swapan Kumar. Petrology and paleogeography of the Lameta Beds and their relation to Bugh Beds of Bugh area. Jadavpur, Geological Sciences, 1965-68. Chanda, S. K., Lecturer.

The project deals with the drawing up of the Createems paleogeography of the Narmada Valley on the basis of the stratigraphy and sedimentation of the Lameta and Bugh sediments.

551.7

1411.64 Shah, Swom Kishan. Contribution to the geology of Suran Valley in Poonch. Jammu & Kashmir, Geology, 1965-67. Wakhloo, Shambu Nath, Professor and Head of the Department.

The Suran Valley section in Poonch is one of the most important sections of the Pir Panjal, not only because all the important stratigraphic units of the western Kashmir are exposed along it but also because this area has a direct bearing on the general structural evolution of the Pir Panjal area. The purpose of the study is to work out the detailed stratigraphy and historical geology of the area. The rock formations involved are the metamorphics referred to as the Dogra slates, the Panjal volcanics, the unfossiliferous Tanawals and the eocenes which are thrusting on the younger murrees.

551.7

Geologic Time & Age Measurements

1412.65 Bhandari, Anil Kumar. Geochronology of the Himalayan gneisses and granites in Mandi area. Panjab, Geology, 1966-68. Kharkwal, A. D., Reader.

The work has been undertaken to date radiometrically the Himalayan granites and gneisses lying between Jogindernagar and Manali. This dating will help in correlating the granites and gneisses, which are repeated within the area, and to solve the problem of granites of different ages and their correlation with other areas.

551.701

1413.66 Chakrabarti, Arun Kumar. Geomorphology and geology of the area around Ganjam and Rambha, Orissa. I.I.T., Kharagpur, Geology & Geophysics, 1966-69. Niyogi, Dipankar, Asstt. Professor.

A study is being made of geomorphology, structure and stratigraphy of pre-cambrian rocks around Ganjam and Rambha, Orissa, on the basis of aerial photographs and field investigations.

551.71

1414.67 Chaudhuri, Asrukumar. Study of late pre-cambrian and associated archaean and Gondwana rocks of Nellore District, A. P. Calcutta, Geology, 1964-67. Raychaudhuri, B., Lecturer.

551.712

1415.68 Ghosh, Prakaschandra. Study of the petrological evolutions of the pre-cambrian rocks in the eastern part of Purulia District, West Bengal, with special reference to titanium mineralisation. Calcutta, Geology, 1965-68. Saha, A. K., Professor, Saha Institute of Nuclear Physics, Calcutta.

551.71

1416.69 Patel, Mohanbhai Parasottamdas. Geological investigations of the rocks of the Sabarkantha District, Gujarat State, with special reference to their stratigraphy, structure and metamorphism. Baroda, Geology, 1965-67. Merh, S. S., Professor and Head of the Department.

An investigation of the structural and metamorpic characters of the pre-cambrian rocks has been undertaken.

551.71

1417.70 Sudarsana Raju, Channaaraju. Structural and Petrological studies in the pre-cambrian rocks east of Khammam. Osmania, Geology, 1961-66. Janardan Rao, Yerramilli, Professor and Head of the Department.

Nearly 300 sq. miles of the east of Khammam has been geologically surveyed and structural data on folds, faults, foliation, lineation, joints, veins and dykes collected. Optical studies have been completed on 300 samples out of a collection of 800. Frequency and pole, and microfatric diagrams have been drawn on the basis of structural data and quartz optic axis respectively. Quantitative petrological studies on granulites and charnockites have been made. X-ray, chemical and D. T. A. studies are in progress.

(1) Statistical slope analyses of the Raghunath Palem Hill. Curr. Sci. 31 ; Sept. '62 : p. 378-379 ;

(2) Diffusion through plagiclase feldspars and its bearing on myrmekite formation. ibid. 33(10) May; '64 : p.307-308 ; and (3) Quantitative petrological studies of the granulites, east of Khammam, A. P. JIGSA. 5 ; 1965: p. 65-74.

551.71

Cretaceous Period

1418.71 Gnanamanickam, Victor Rajamanickam. Cretaceous and tertiary sedimentation in the Cauvery Basin. Annamalai, Geology, 1965-68. Rajagopalan, N., Reader.

Heavy mineral studies of the late cretaceous and early tertiary sediments of the Pondicherry area have been completed. Detailed petrological, micropaleontological and paleoecological studies of the cretaceous and tertiary formations of Tiruchirapalli, Vriddhachalam and Pondicherry areas are proposed to be undertaken.

551.77

Tertiary Period

1419.72 Bhatia, Tilak Raj. Petrology of the Siwalik formations in the Jammu region. Jammu & Kashmir, Geology, 1965-67. Wakhloo, Shambu Nath, Professor and Head of the Department.

Siwalik formations of India, upper tertiary age, have been developed magnificiently along the foothills of Jammu region. These are mainly composed of conglomerates, sand stones, silt stones and clays. No worker has published any account of the petrography of these rocks so far. In recent years, many new techniques have been developed towards the interpretation of the nature of the source, area, environment of deposition, types of transporting agencies, flow directions and host of other geological problems pertaining to sedimentary rocks. An attempt has been made to apply these new methods for the study of the Siwalik formations and newer data obtained so far is being processed. The area studied in this connection lies between latitudes 32°-0′ N and longitudes 74°- 45′ to 75° -30′ E.

551.78

1420.73 Chaudhri, R. S. Geology of the lower tertiary rocks of the Simla Hills, Panjab and Himachal Pradesh. Panjab, Geology, 1963-66. Naidu, P. R. J., Professor (Retd.).

The tract, to which the present work relates, covers an area of about 650 sq. km. in the Simla Hills of the Panjab Himalayas. Main emphasis is on the stratigraphical, petrological and sedimentological aspects of the lower tertiary rocks—Paleocene-Lr. Miocene.

551.78

1421.74 Sharma, Vijayanand. Studies in tertiary Foraminifera of Car Nicobar Island, India. Banaras, Geology, 1966-68. Rajnath, Professor and Head of the Department.

The research has been undertaken to study the stratigraphic ranges of Foraminifera, palaeo-environmental trends, and to carry out a comparative study of foraminiferal biostratigraphy and palaeoecology of the island with adjacent regions in the light of the possibility of the occurrence of oil and natural gas.

551.78

1422.75 Srivastava, Shambhoo Sharan. Studies in lower tertiary stratigraphy and micropaleontology of Assam. Banaras, Geology, 1965-67. Rajnath, Professor and Head of the Department.

A detailed study is being made of the taxonomic composition and geographic distribution of the microfaunas collected from different sections in Assam. Biostratigraphic divisions of the strata have been studied to determine paleofacies by microfaunas, the depth, temperature, salinity and movements of ocean currents of the tertiary seas to establish type localities and standard or type or reference sections of the marine tertiary stages.

551.78

Quaternary Period

1423.76 Bhardwaj, Brij Lal. Studies on the pleistocene deposits of Kashmir. Jammu and Kashmir, Geology, 1966-69. Wakhloo, Shambu Nath, Professor and Head of the Department.

The pleistocene formations of Kashmir comprise the Karewas which are present throughout the valley in discontinuous outcrops. It is proposed to study the vertebrate and plant fossils available in the Karewas and the sedimentology of this formation on the modern statistical basis.

551.792

Structural Geology

1424.77 Jain, Arvind Kumar. Stratigraphy and structure of Garhwal Himalayas, District Uttar Kashi, U. P. Roorkee, Geology, 1965-68. Mithal, Rajendra Singh, Professor and Head of the Department.

5

1425.78 Nautiyal, Mahendra Datt. Tectonic and stratigraphic interpretation of a part of Bhillangara Valley. Roorkee, Geology, 1964-67. Mithal, Rajendra Singh, Professor and Head of the Department.

551.8

1426.79 Pasayat, Samarjit. A critical study of zonal patterns of metamorphism in relation to tectonics etc. I. I. T., Kharagpur, Geology & Geophysics, 1965-68. Bhattacharyya, D. S., Lecturer.

Structural analysis of the data collected reveals two phases of deformation. The petrographical study also points to two phases of high grade metamorphism. The time relation between the phases of metamorphism and of tectonic movements is being established.

551.8

1427.80 Sengupta, Sugata. Structural history of metamorphic rocks near Kharwa, District Ajmer, Rajasthan. Calcutta, Geology, 1960-68. Sen, S. N., Professor and Head of the Department.

551.8

1428.81 Vijaya Raghava, M. S. Structure of Kalwa area, Cuddapah Basin, A. P., by integrated geophysical methods. Osmania, Geology, 1963-68. Suri, Balakrishna, Asstt. Director, National Geophysical Research Institute, Hyderabad.

The Kalwa area in the Cuddapah Basin is known for its structural complexity. Except for some geological studies a few decades ago, no thorough geological and geophysical investigations have been held in this area which has promising potentialities for metallic mineral deposits. Studies on the north of the area including Kurnool town have been completed using magnetometer. Preliminary magnetometric work in Kalwa area has given interesting results and shows possible mineralisation within shallow depths.

(1) Magnetic anomalies in the granities of Hyderabad. Jour. Geo. Soc. India. 3 ; 1962 ; (2) Magnetic susceptibilities of the Hyderabad granites. Bull. N. G. R. I. 1(1) ; 1963 ; (3) Some results of magnetic survey near Kurnool, A. P. JIGSA, symposium on Cuddapah Basin. 3 ; 1964 ; and (4) On the determination of seismic source co-efficients. JIGU. 3(1) : 1966.

551.8

Faults & Other Deformations

1429.82 Anjanappa, K. Geological and petrological studies of parts of archaeans of Peninsular India. Venkateswara, Geology, 1965-68. Suryanarayana, K. V., Reader.

Dolerite dykes around Tirupati, Chittoor District, A. P. intruded into granites have been investigated. During the course of the investigation, conversion of dolerite into chlorite schist by faulting has been noticed. The process involved in the conversion of dolerite into chlorite schist is being interpreted.

551.88

1430.83 Chaudhuri, Alok Kumar. Superposed folding in a part of the early pre-cambrian terrain of Central Rajasthan. I. I. T., Kharagpur, Geology & Geophysics, 1963-66. Naha, K., Asstt. Professor.

A major part of the hammerhead syncline in Central Rajasthan has been mapped to the scale of 8 inches to 1 mile. Two sets of deformations have been recognised and their time relations established. An attempt has been made to trace the evolution of the banded gneissic complex and decipher the stratigraphy of the metasediments on the basis of the structural data in this highly folded pre-cambrian terrain.

551.87

1431.84 Nene, Shard Ganesh. Structural control and genesis of the pegmatites around Bhilwara, Rajasthan. Roorkee, Geology, 1962-66. Mithal, Rajendra Singh, Professor and Head of the Department.

551.88

1432.85 Prasad, C.V.R.K. The petrography and paleomagnetism of the Lower Cuddapah formations and the dykes from adjoining archaeans. Venkateswara, Geology, 1961-66. Suryanarayana, K. V., Reader.

It is proposed to study the attitude of the geomagnetic poles at the time of formation of the Lower Cuddapah rocks, continental drifting and stratigraphical correlation of Cuddapah with other similar formations in the country.

551.88

Geochemistry

1433.86 Bandyopadhyay, Pranabkumar. Geology and geochemistry of the Sukinda chromite field, District Cuttack, Orissa. Calcutta, Geology, 1962-67. Chatterjee, P. K.

551.9

1434.87 Dhar, Moti Lal. Trace elements in rocks in Jammu and Kashmir. Jammu & Kashmir, Chemistry, 1966-69. Bhattacharya, Abnai Kumar, Professor and Head of the Department.

Some typical rocks, minerals and soils of Jammu and Kashmir will be analysed and other physico-chemical properties and the structure of the clay minerals studied. The analysis of a sample of rock is being carried out.

551.9

1435.88 Lal, Abhai Nath. Geochemistry of the metasediments of the Parasnath complex, Bihar. Banaras, Geology, 1966-68. Verma, S. N., Lecturer.

Detailed studies will be carried out on the behaviour of major and trace elements of the pelitic and psamo-pelitic metasediments of the Parasnath complex, supplemented by petrographic observations. These studies will throw light on the origin of the rocks of the Parasnath complex.

551.9

1436.89 Rama Rao, G. V. S. Geochemistry of iron ores of some selected parts of Andhra Pradesh. Venkateswara, Geology, 1964-67. Chakrapani Naidu, Muthyal Govindaswami, Professor and Head of the Department.

Ore microscopic studies, chemical analysis and magnetic studies of iron ores and the associated rocks, like charnockites, have proved the possibility of their formation under similar conditions from the pre-existing rocks. A correlation of mineralogy, chemistry and magnetic properties of the low grade magnetite ores of Ongole area, District Guntur, has been attempted. Further work on the study of the susceptibility and anisotropy of magnetites with a correlation of optical anisotropy is in progress.

A new occurrence of titanomagnemite from South India. Can. Mint. 8(3) ; 1965 : p.334-338.

551.9

1437.90 Ram Murti. Geochemistry of the rocks occurring around Kajrahat, Mirzapur, U. P. Banaras, Geology, 1966-68. Tiwari, B. D., Reader.

Mapping and field work has been done and nearly 500 samples collected. Thirty rock sections have been prepared and microscopic studies done. Thirty rock powders ready for chemical analysis will be studied and followed by trace element and X-ray studies. The results thus obtained will be tabulated and plotted revealing geochemical properties.

551.9

1438.91 Ray, Sobhen. A chemical study of equilibrium relations in mineral assemblages of granulites and amphibolites of the charnockite suite. I. I. T., Kharagpur, Geology & Geophysics, 1966-69. Sen, Sisir Kumar, Asstt. Professor.

A hitherto unreported geological structure of the type charnockite has been noted in the area, Twenty chemical analyses—five orthopyroxenes, five clinopyroxenes, five amphiboles and five parent rocks—have been done. The analytical study reveals that distribution constant $KD^{Opx\text{-}cpx}_{Mg\text{-}Fe}$ varies between 0.59 and 0.66 suggesting high grade metamorphic origin.

551.9

1439.92 Suryaprakasa Rao, A. Geochemical studies of Deccan traps. Osmania, Geology, 1964-67. Janardan Rao, Yerramilli, Professor and Head of the Department.

Samples have been collected from various flows of Deccan traps from the States of Andhra Pradesh, Maharashtra and Gujarat. Petrographic studies and chemical analysis of the rock samples are in progress.

Elastic properties of andestic lavas from Japan. Curr. Sci. May '63.

551.9

1440.93 Yadawa, Bhai Ram. Geology and geochemistry of rocks around Mundwara, Sirohi in the State of Rajasthan. Banaras, Geology, 1966-68. Rajnath, Professor and Head of the Department.

Detailed geological mapping has been completed. 400 rock samples have been collected and numbered, and their powders are being prepared for geochemical and X-ray investigations. Rock slides are also being prepared for petrological studies.

551.9

Petrology

General Principles

1441.94 Gogte, Balakrishna Shankar. Petrographic studies on aggregates for alkali aggregate reactions. Roorkee, Geology, 1963-67. Mithal, Rajendra Singh, Professor and Head of the Department.

552.06

1442.95 Lakshmipathy, S. Sedimentation patterns during Cuddapah and Kurnool times. I.I.T., Kharagpur, Geology & Geophysics, 1965-68. Rao, C. N., Lecturer.

The size and heavy mineral studies have been completed and it is proposed to undertake X-ray and DTA studies of the clays.

552.06

1443.96 Mihir Dev. Conditions of ore mineralisation in the Roam Rakha mines area. Jadavpur, Geological Sciences, 1966-69. Sarkar, Sanjib Chandra, Lecturer.

The petrology of the host rocks, structures controlling the orebodies, mineralogy and geochemistry of the ore and gangue minerals will be studied. In the light of these observations, genesis of the deposits will be interpreted.

552.01

1444.97 Mittal, Anand Kumar. Resistivity methods applicable to hydrological problems. Roorkee, Geology, 1965-68. Gaur, Vinod Kumar, Reader.

A model of the canal will be made through which seepage from different places could be studied. It is possible only by the study of porosity and permeability of sand of different formations and quality.

552.06

1445.98 Pal, Chanchal Kumar. Geochemical exploration of base metal deposits in Sikkim. Jadavpur, Geological Sciences, 1966-68. Mitra, Sachinath, Lecturer.

The research will comprise (1) Reconnaissance survey of chemical composition of the mineralised areas by studying the steam sediments and ground water ; (2) Mapping of the area and collection of samples of soil and vegetation ; (3) Study of the geology of deposits with particular emphasis on the structural control, mineralogical guides to the solution paths and the factors causing localisation of the deposit ; (4) Development of suitable methods and sensitive chemical reagents for assaying these elements in the type soils and drifts in the mountainous terrains ; and (5) Experiments to ascertain reasons for the preferential elution or teaching out of these elements in a particular oxidation state from the mineral matrix to find out the eluting agents.

552.01

1446.99 Pal, Poorna Chandra. Palaeomagnetic investigation of certain Indian rocks. Osmania, Geology, 1966-68. Bhimasankaram, Vemu Lakshminarayana Subramanya, Reader.

Oriented rock samples from several geological horizons have been collected and are being investigated in the laboratory. The direction of the natural remanent magnetic vector in rocks and behaviour of the vector magnetisation with temperature and stability tests on the primary magnetization under alternating magnetic fields of different peak intensity values are being studied.

552.06

1447.100 Ahuja, Suraj Prakash. Geology of the area west of Mukteswar, District Nainital, U. P. Panjab, Geology, 1965-68. Pande, I. C., Professor and Head of the Department.

It is proposed to map an area of 65 sq. km. lithologically and structurally. On the basis of a detailed study of the petrography of various lithological units, their mineral genesis, structural and petrofabric diagrams, an attempt will be made to build a reasonable metamorphic and tectonic history of the area, and correlate it with other adjoining areas.

552.02

1448.101 Ansari, Saleem. Geology of the area around Chamba. Aligarh, Geology, 1966-69. Srivastava, V. K., Reader.

552.02

1449.102 Asadulla Shariff. A detailed structural and petrological study of the charnockites occurring around Kushalnagar, Coorg District, Mysore State, South India. Mysore, Geology, 1963-67. Govinda Rajulu, B. V., Reader.

A detailed petrological and structural investigation of charnockites along with the associated rocks around Kushalnagar is in progress since 1963. An area of nearly 70 sq. miles has been mapped to a scale of 8″ to 1 mile. The minerals of the rocks have been studied for their optical properties both according to the classical and U-stage methods. It is also intended to undertake the chemical analysis of selected rock samples to determine their mode of formation.

552.02

1450.103 Barua, Kumud Chandra. Stratigraphic and sedimentological study of Tura sandstone near Tura, Garo Hills, Assam. Gauhati, Geology, 1962-67. Choudhury, J. M., Professor and Head of the Department.

The mapping of the area has been completed. It comprises igneous, metamorphic and sedimentary rocks. It is proposed to study the petrography of the igneous rocks under U-stage, their chemical analysis and interpretation ; petrography and interpretation of metamorphic rocks ; and mechanical and heavy mineral analysis of sedimentary rocks and their interpretation. The microfossils have also been studied to determine the age of the formation.

552.02

1451.104 Bhattacharyya, Shyambijay. Stratigraphy and petrology of the Vindhyan rocks of the Sone Valley with special reference to porcellasites. Calcutta, Geology, 1965-68.

Basu, Nitinkumar, Lecturer, Geological Sciences, Jadavpur University.

552.02

1452.105 Bhogisetti, Mahabaleswar. Geology of the area around Sivasamudram, District Mandya, Mysore State. Karnatak, Geology, 1964-67. Sadashivaiah, Mysore Subbanna, Professor and Head of the Department.

A detailed study of the charnockites and the associated rocks—gneisses, granites, dykes etc.,--of Sivasamudram area has been undertaken. The field relationship, mapping and structural geology of these rocks have been worked out. The petrology, mineralogy and petrochemistry of these rocks will also be investigated to throw light upon their petrogenesis.

552.02

1453.106 Bisaria, Pramod Chandra. A study of metamorphites of Jutogh sediments in south of Chor area. Panjab, Geology, 1966-68. Saxena, M. N., Lecturer.

It is proposed to map the area in detail and study it from the structural and petrological points of view. The general relationship of these features will be established.

552.02

1454.107 Butt, Abdul Majid. Geology of the Kala Kot area. Aligarh, Geology, 1966-69. F. Ahmad, Professor and Head of the Department.

552.02

1455.108 Chadha, Devinder Kumar. A study of Jutogh metamorphites on the north-east side of the Chor area. Panjab. Geology. 1965-68. Pande, I. C., Professor and Head of the Department.

The work has been undertaken to investigate the area, both petrologically and structurally, and to trace its geological history on the basis of cross section and structural diagrams.

552.02

1456.109 Chakravarthi, Sundarashyam. Studies on Dharwars and associated rocks of Raidhur area. Osmania, Geology, 1966-69. Janardan Rao, Yerramilli, Professor and Head of the Department.

Studies on structural and metamorphic aspects of Garhwal band of schists and the associated peninsular granites and gneisses are in progress. These are expected to throw light on the structural trends and complex metamorphism of the rocks of the area.

552.02

1457.110 Chatterjee, Adya Charan. Petrology of the Deccan traps near Bhopal. Vikram, Geology, 1966-70. Chatterjee, S. C., Professor and Head of the Department.

552.02

1458.111 Damle, G. V. Geology of the area around Udaipur with special reference to sedimentation and structure. Udaipur, Geology, 1965-67. Shukla, R. T., Lecturer, Department of Geology, University of Rajasthan, Jaipur.

The area around Udaipur is one of the most representative sections of the Aravelli System. Its stratigraphical succession and the nature of sedimentation have not been studied in detail so far. It has been observed that a lot of sedimentary and diastrophic structures exist there. The present study attempts to establish stratigraphy, structure and the nature of sedimentation of the area.

552.02

1459.112 Desai, Subhash Jagdishkumar. The stratigraphy, structure and metamorphism of the area around Majkhali, District Almora, Uttar Pradesh. Baroda, Geology, 1964-66, Merh, S. S., Professor and Head of the Department.

The study of the successive tectonic episodes of the Kumaon region, and their effects on the rocks of the area has been taken up for investigation.

552.02

1460.113 Deshpande, Gunaker Gunwant. Petrologic and structural analysis of the Deolapar metamorphites. Nagpur, Geology, 1965-70. Kilpady, Sripadrao, Professor and Head of the Department.

The project involves a detailed study of the petrology and structure of the Deolapar area in Nagpur District to re-examine the occurrence of a nappe structure in the region. The work is proposed to be done on the basis of data obtained by detailed structural mapping, microscopic, chemical and petrofabric analysis and in the light of new concepts regarding sedimentary and metamorphic facies.

552.02

1461.114 Despande, Yeshvant Vamanrao. Geology of the area around Kumta, N. Kanara District, Mysore State, with special reference to its structure and metamorphism. Baroda, Geology, 1964-67. Merh, S. S., Professor and Head of the Department.

A detailed study is being made of the regional geology to establish the stratigraphy, structure and metamorphism of the Dharwarian rocks of the area.

552.02

1462.115 Devaraju, Thadasore Chikkegowda. The charnockites and the associated rock types of the area around Satnur-Halaguru, Mysore State. Karnatak, Geology, 1962-67. Sadashivaiah, Mysore Subbanna, Professor and Head of the Department.

The charnockites and the associated rock types of the Satnur-Halaguru area have been mapped geologically. Their field relationship, structural geology, petrology, mineralogy and petrochemistry have been worked out in detail. The data has been analysed to deduce their petrogenesis and to reconstruct the geological history of the area.

(1) Ind. Mint. 4(1 & 2) : p.5-13 ; (2) ibid. 5(2) : p. 105-116 ; (3) ibid. 6(1&2) : p. 27-36 ; and (4) Bull. Geo. Soc. India. 3(1) : p. 1-4.

552.02

1463.116 Dwivedi, Radhika Dutta. Charnockites of Wainganga Valley: Petrology, petrogenesis and economic importance. Jabalpur, Geology, 1963-67. Subba Rao, Garapati, Reader and Head of the Department of Geology, Govt. Science College, Jabalpur.

Systematic geological mapping of charnockitic rocks over about 200 sq. miles along the Wainganga Valley of Chanda, Bhandra and Balaghat, Districts, has been completed. Detailed petrological and mineralogical studies are in progress. It is hoped that these field and laboratory studies will throw light on the origin of charnockitic and associated rocks.

552.02

1464.117 Garg, Nand Kumar. A petrological study of Mount Abu Batholith, Rajasthan. Vikram, Geology, 1966-70. Chatterjee, S. C., Professor and Head of the Department.

552.02

1465.118 Ghani, Noman. Petrology of the lavas of northern slopes of Rajpipla Hills, Gujarat. Vikram, Geology, 1966-70. Chatterjee, S. C., Professor and Head of the Department.

552.02

1466.119 Gupta, L. N. Geology and petrology of the central gneisses and associated rocks of the Dhauladhar Range, north of Dharamsala, Kangra District, Panjab. Panjab, Geology, 1963-67. Naidu, P. R. J., Professor and Head of the Department (Retd.).

The petrological, mineralogical and chemical studies of the area reveal that the central gneisses of the Dhauladhar Range are the product of metasomatic replacement of the metasediments.

552.02

1467.120 Jagannatha Rao, Jogiraju. The geology of Salur-Bobbili area, District Srikakulam, Andhra Pradesh. Venkateswara, Geology, 1964-67. Chakrapani Naidu, Muthyal Govindaswami, Professor and Head of the Department.

About 130 sq. miles of the area has been geologically mapped. Optical constants of several minerals from charnockites and khonadalites of the area have been determined. Special attention has been paid to the economic potentialities of the new garnet deposit near Bobbili, District Srikakulam. Chemical analysis of different rocks and minerals of the area is in progress.

552.02

1468.121 Jambusaria, Bhagirathkumar Balashanker. Geology of the area around Shivrajpur, District Panchmahals, with special reference to its structure, stratigraphy and metamorphism. Baroda, Geology, 1965-67. Merh, S. S., Professor and Head of the Department.

A detailed study is being made of the champaner rocks including their stratigraphy, sedimentation, structure and metamorphism.

552,02

1469.122 Ketharaju, Surya Prakash Rao. The evolution of plutonic rocks of Kannegiri Hill Area, District Khammam, A. P., India. Osmania, Geology, 1962-66. Janardan Rao, Yerramilli, Professor and Head of the Department.

An area of 300 sq. miles has been surveyed for detailed geological and structural mapping in and around Kannegiri Hill Range in District Khammam of Andhra Pradesh. A number of samples representing all the rock types have been collected and subjected to detailed optical studies in the laboratory. The rocks have been divided into three groups—A, B and C comprising schists and gneisses, amphibolites and their associates, and charnockites, granulites, khondalites etc., respectively. Intense laboratory work has been carried out to trace the evolutionary sequence of the plutonites. Similar studies have been extended towards the south of the hill range touching Eastern Ghats and the work is in progress. These studies will provide an opportunity to understand the structural trends and the complex regional metamorphic history of the region from Kannegiri Hill Range to Eastern Ghats in the South.

(1) A note on the geology of south-western part of Kannegiri Hills, A. P. Curr. Sci. 32 : Oct. '63 ; and (2) Occurrence of pegmatites, south of Kannegiri Hills, A. P. Bull. Geo. Soc. India. e(1) : 1966.

552.02

1470.123 Khalid Rashid. Geology of the Chamba area. Aligarh, Geology, 1966-69. Srivastava, V. K., Reader.

552.02

1471.124 Kripanidhi, Amencherla. Geological and petrological studies of crystalline schists of some parts of archaean terrain, Peninsular India. Venkateswara, Geology, 1964-67. Suryanarayana, K. V., Reader.

A geological map of an area of about 100 sq. miles in the Chennapatna area, District Bangalore, has been prepared. The mineralogical, optical, and petrographical aspects of the rock types have been studied in detail. Mineral separation has also been carried out. Chemical analysis of the rock types is in progress.

552.02

1472.125 Mahajan, Gautam. The geology of the area south of Chail with special reference to tectonic and metamorphic history. Panjab, Geology, 1965-68. Pande, I. C., Professor and Head of the Department.

The study covers the area which lies in the Simla Himalayas. The area has been selected with a view to reconstruct its structural and metamorphic history. The area will also be correlated with the surrounding areas.

552.02

1473.126 Mohammed Ikramuddin, Mohammed Faizuddin. Geology of the area around Bidadi-Harohalli, District Bangalore, Mysore State. Karnatak, Geology, 1964-67. Sadashivaiah, Mysore Subbanna, Professor and Head of the Department.

A detailed study of dyke swarm and other associated rocks—charnockites, granites gneisses etc.,—of Bidadi-Harohalli area has been undertaken. The occurrence of hypersthene-olivine dolerite, basaltic dykes, normal dolerites, quartz dolerites and oligoclase dolerites in association with the dykes of phonolitic and trachytic composition suggests that the dyke swarm has evolved as a result of differentiation of basic magma.

552.02

1474.127 Nageswara Rao, Manchem. Igneous activity and mineralisation in parts of Cuddapah and Anantapur Districts, A.P. I. I. T., Kharagpur, Geology & Geophysics, 1964-67. Bagchi, T. C., Professor and Head of the Department.

The Lower Cuddapah formations in the area around Pulivendla in District Cuddapah have been mapped and systematic samples collected from the basic sills. The optical and chemical studies have been carried out to discern the trends of differentiation. The process of serpentinisation has been studied using the infrared, X-ray diffractometry, and D.T.A. The origin of the barite and associated sulphides has been outlined and a brief account of the sedimentation during the Lower Cuddapah times given.

552.02

1475.128 Narasimha Rao, Kodali Lakshmi. The charnockite series and the associated rock types of Chimakurti area, District Guntur, Andhra Pradesh, South India. Venkateswara, Geology, 1963-68. Chakrapani Naidu, Muthyal Govindaswami, Professor and Head of the Department.

An area of about 60 sq. miles has been geologically mapped on 4″ to a mile scale around Chimakurti, District Guntur, A.P. The mineralogy and petrology of the rock formations of the area, like khondalites, charnockites, granites and dyke rocks have been studied. Geochemical aspects of these rock types will also be studied.

552.02

1476.129 Narasimha Rao, Pulipaka. Petrological studies in the crystalline complex of Palni-Dindigul area, District Madurai. Annamalai, Geology, 1962-67. Muthuswami, T. N., Professor and Head of the Department.

An area of 100 sq. miles has been mapped geologically and detailed optical studies have been carried out. Field and laboratory investigations have been undertaken with special reference to the anorthosites and associated rock types of the area to throw light on their petrogenetic, geochemical and tectonic aspects.

(1) Jour. Annamalai Uni. 25 ; 1964 : p. 89-96 ; (2) Proc. IAS. 60 ; 1964 : p. 135-144 ; and (3) Ind. Mint. 5(2) ; 1964 : p.99-104.

552.02

1477.130 Narula, B. C. Geology of the area around Rajgarh, Simla Hills. Panjab, Geology, 1966-68. Pande, I. C., Professor and Head of the Department.

It is proposed to study the metamorphic and tectonic history of the area and the correlation of the rocks exposed in this area with those exposed in other areas.

552.02

1478.131 Naqvi, S. M. Geology of a part of the Shimoga Belt in Mysore. Aligarh, Geology, 1965-68. F. Ahmed, Professor and Head of the Department and Qureshi, M. N.

552.02

1479.132 Pandit, Mohd. Shafi. Some Himalayan equivalents of the Vindhyan System. Aligarh, Geology, 1966-69. F. Ahmad, Professor and Head of the Department.

552.02

1480.133 Phene, Suhas Govindrao. Geology of the chromite bearing rocks of Nuggihalli schist belt. Karnatak, Geology, 1964-67. Naganna, C., Reader.

A detailed geological and structural mapping of about 250 sq. kms. of Nuggihalli schist belt has been done. The geology of this area has been investigated in order to determine the relation of the granite-gneissic surroundings to the schist, and schist to the ore bearing ultrabasic rocks. The origin of the ore is being explored.

552.02

1481.134 Pramod Chandra. Petrology and genesis of pyrites and associated rocks at Tara Devi, District Simla. Banaras, Geology, 1966-68. Bhattacharya, A. K., Reader.

The X-ray, spectroscopic and geochemical studies and ore microscopy will be undertaken to find out the genesis of pyrites and associated metamorphics.

552.02

1482.135 Rama Rao, Gullapalli. Petrology and economic geology of the area around Meghnagar, Jhabua District, M.P. Vikram, Geology, 1966-70. Chakravarthy, D. K., Reader.

552.02

1483.136 Ravindra Kumar. Structure and geology of the area around Halog, District Mahasu, H. P. Panjab, Geology, 1964-67. Pande, I. C., Professor and Head of the Department.

An area of about 25 sq. miles has been mapped and mesoscopic data and different oriented specimens have been collected. The metamorphic history of the area will be reviewed critically with the help of individual rock species. The structure of the rocks in the area is very complicated and it has been observed that the metamorphic history of the area is closely related to its structure.

552.02

1484.137 Rege, Subhash Mangesh. Petrological investigations on the wollastonite-scapolite granulites of Garividi, A. P.

I.I.T., Kharagpur, Geology and Geophysics, 1964-67. Mukherjee, Amal Bikash, Lecturer.

Geological mapping and sampling of all the rock types have been done over a 100 sq. miles area. Over 50 minerals have been separated and chemically analysed. An optical and X-ray powder photographic study has been carried out of about 25 minerals. A petrological analysis is being done on the basis of this data and theoretical and experimental information available on analogous compositional systems.

552.02

1485.138 Rizvi, S. Rafi Ahsan. Geology of the Hazaribagh District. Aligarh, Geology, 1966-69. Srivastava, V. K., Reader and Murty, M. V. N., Geological Survey of India, Calcutta.

552.02

1486.139 Saiprasada Rao, Barrala. Geology of parts of Podili and Kanigiri Talukas in District Nellore, A. P. Venkateswara, Geology, 1965-67. Satyanarayana Murty, Matukumalli, Lecturer.

The geological survey of an area of about 120 sq. miles around Podili and Kanigiri has revealed the occurrence of granites, schists, quartzites, and dolerites in their order of abundance. The petrograpic study of the rocks has been completed. The determination of the twin laws, anorthite content of the plagioclase feldspars and optical constants of other minerals has also been made. Chemical analysis of minerals and rocks is in progress.

552.02

1487.140 Saklani, P. S. Geology of the area around Pratapnagar, District Tehri Garhwal, U. P., with special reference to its structural and metamorphic history. Panjab, Geology, 1963-67. Pande, I. C., Professor and Head of the Department.

An area of about 25 sq. miles has been mapped and the structural details have been plotted on the map. The metamorphic history of the area has been established on the basis of the study of rocks. Mesoscopic data has been critically analysed and with its help the major structure in the area has been studied. The correlation of metamorphic with tectonic history in the area will also be established.

552.02

1488.141 Salmani, Mirza Naser Baig. Studies on the eastern ghats in parts of Krishna and Guntur Districts, A. P. Osmania, Geology, 1965-68. Janardan Rao, Yerramilli, Professor and Head of the Department.

A part of the area of Krishna District has been geologically and structurally mapped. Laboratory studies are in progress. These studies will help to understand the complex tectonic and metamorphic history of the area.

552.02

1489.142 Sarkar, Samirkanti. Petrology of alkali abimic basalts and tholents of Central Kutch, Gujarat. Calcutta, Geology, 1964-67. De, Aniruddha, Lecturer.

552.02

1490.143 Md. Sayedur Rahman. Petrological and structural studies of the rocks around Shillong and Mylliem, K & J Hills, Assam. Gauhati, Geology, 1962-68. Choudhury, J. M., Professor and Head of the Department.

The area has been mapped geologically and the petrography of granite, epidiorite, quartzite and xenoliths studied. The structural features of these rocks have been interpreted and the petrofabric studies of quartzites completed. The study of grain orientations of quartz and mica in granites is in progress. The chemical analysis of rocks will also be done.

Petrology of the Mylliem granite, Mylliem, K & J Hills, Assam. Gauhati Uni. Jour. 10 (2) : 1959.

552.02

1491.144 Seth, D. K. The geology, petrology and structure of rocks in Bangar and adjoining areas of Kulu District, Panjab, with special reference to uranium mineralization, Roorkee, Geology, 1965-66. Mithal. Rajendra Singh, Professor and Head of the Department.

The mapping of 50 sq. miles of area at heights between 3500′-13050′ in the high Himalayas has been completed. It is proposed to extend it to the surrounding areas bearing the radioactive minerals. The rock and mineral specimens collected are under study.

552.02

1492.145 Setty, Suryanarayana. Geology of the eastern part of Holenarasipur schist belt, District Hassan, Mysore State. Bangalore, Geology, 1966-69. Varadarajan, S., Lecturer.

The area under research comprises Dharwarian formation which has undergone repeated movement and metamorphism. It is proposed to map the area on a scale of 4″ = 1 mile bringing out all the structural features. From the structural details and laboratory study—petrological, mineralogical and chemical—it is intended to classify all the rock types, delineate the metamorphic impress of the formations and reconstruct the tectonic and metamorphic history of the schist belt.

552.02

1493.146 Shende, Ramdas Sadashivrao. Structure, stratigraphy and petrology of the rocks around Ramakonda in Sausar Tehsil, Chhindwara District, M. P. Vikram, Geology, 1966-70. Chatterjee, S. C., Professor and Head of the Department.

552.02

1494.147 Somayajulu, Puchha Venkata. Geology and plutonic history of Arjana Sand Mata area, Rajasthan. Osmania, Geology, 1961-66. Suri, Balakrishna, Asstt. Director, National Geophysical Research Institute, Hyderabad.

An area of 100 sq. miles has been geologically mapped. The petrological investigations include a detailed petrographic study of 400 thin sections, the petrochemistry including the trace element study of the important rock units with special emphasis on the petrogenesis and metamorphic history of the area.

552.02

1495.148 Surendar Kumar. Geology of the area around Manali, Kulu, with special reference to its structure. Panjab, Geology, 1965-68. Pande, I. C., Professor and Head of the Department.

It is proposed to map about 60 sq. km. of the area with systematic geological mapping, and to carry out an intensive and extensive study of tectonic and metamorphic history of the various formations constituting schist and gneisses. The petrographic and petrofabric studies will also be undertaken of the metamorphic processes which are responsible for the present mineral equilibrium in the rocks. The structural study will help in deciphering the direction and nature of deformative forces which have been active during the main Himalayan arogeny.

552.02

1496.149 Vaid, Ram Lubhaya. Geology, petrology, structure and uranium mineralization of the Sharhal-Saharandogri Pat-Pan area of Mahasu District. Roorkee, Geology, 1965-68. Mithal, Rajendra Singh, Professor and Head of the Department.

An area of about 10 sq. miles at heights between 5,000′ to 11,000′ in the interior of the Rampur Tehsil of Mahasu District in the Himachal Pradesh has been mapped and widespread uranium mineralization located.

552.02

1497.150 Vashi, Natvarlal Mohanlal. Geology of the area around

Pilkholi-Rahikhel, District Almora, with special reference to its structural and metamorphic history. Baroda, Geology, 1962-66. Merh, S. S., Professor and Head of the Department.

A detailed structural and metamorphic study has been undertaken to correlate the two aspects of Himalayan geology. An attempt is being made to understand the structural geology and the sequence of various tectonic episodes.

552.02

1498.151 Verma, Bhagwati Prasad. Geology of the Vindhyan area in Mirzapur District. Aligarh, Geology, 1965-68. F. Ahmad, Professor and Head of the Department.

552.02

1499.152 Verma, Pramod. The study of the geology around Dangoli, U. P., India, with special reference to its structural and metamorphic history. Panjab, Geology, 1964-67. Pande, I. C., Professor and Head of the Department.

The various types of rocks encountered in the Dangoli area, in the Chandpur Series of Kumaon Himalayas are metasediments, migmatites and amphibolites. The field relations of these rock units and the minor structures present in them suggest more than one period of deformation. Textural and structural relationships between different minerals under microscope also point towards more than one period of mineral formation.

552.02

Igneous Rocks

1500.153 Dutta Gupta, Samarjeet. Petrology of the gabbroanorthosite suite of rocks with special reference to the mineralogy and genesis of charmite and iron ore deposits of Bhuvan and Kalnargi. Jadavpur, Geological Sciences, 1965-68. Chakraborty, Kanai Lal, Reader.

A detailed petrological investigation of the complex igneous suite of rocks comprising gabbro, pyroxemite, dolerite and auothosite is being carried out together with their chemical analysis and mineralogy. The genesis of the charmite iron ore deposits of Bhuvan and Dhenkanal Districts of Orissa will also be investigated.

552.1

1501.154 Sethna, S. F. Petrological studies of the igneous complex of Phenai Mata, Chhota Udaipur. Bombay, St. Xavier's College, Bombay, 1964-67. Sukheswala, R. N., Professor and Head of the Department of Geology, St. Xavier's College, Bombay.

The area is a fine example of an igneous complex in which the tholeiitic magma together with its differentiates erupted to give rise to a variety of rock types. An alkaline suite of rocks has also erupted in the area. The Phenai Mata Hill is considered a deeply eroded volcano revealing a composite plug of the Deccan Trap volcanic episode. Detailed chemical and mineralogical work has been carried out to understand the nature of the magma type and its differentiation trend. The area also reveals a gabbro body that shows both rhythmic and cryptic layering.

552.1

1502.155 Taron, Pulin Behari. Petrology of the igneous complex around Sukinda, Orissa, India, with special reference to the associated banded iron formations. Jadavpur, Geological Sciences, 1966-70. Chakraborty, Kanai Lal, Reader.

The igneous rock suite of the area comprises rocks ranging in composition from ultrabasics to acids. The origin and evolution of this suite has been worked out in detail with the help of modern geochemical and petrographical techniques.

552.1

Plutonic Rocks

1503.156 Agrawal, Ambika Prasad. Geology of Kanker area. Jabalpur, Geology, 1965-68. Subba Rao, Garapati, Professor and Head of the Department of Geology, Govt. Science College, Jabalpur.

An area of about 100 sq. miles around Kanker is being systematically mapped. It is proposed to make a detailed petrological and structural study of the granites of the region to establish their relationship with other rocks and to work out the origin of these granitoid rocks.

552.3

1504.157 Baleeguddin Husain. Structural and petrological studies on granites of Hyderabad. Osmania, Geology, 1960-67. Suri, Balakrishna, Asstt. Director, National Geophysical Research Institute, Hyderabad.

Detailed geological mapping of nearly 100 sq. miles of Hyderabad granites has been done. Structural and geological data have been collected. About 100 thin sections have been studied with special reference to their textural peculiarities and their bearing on evolutionary history of the area. Petrofabric studies of few sections have also been completed. Aerial mineralogical variations have been studied and structural frequency diagrams, including tectonic history, are under preparation. Chemical studies will also be undertaken.

552.3

1505.158 Bandyopadhyay, Ramendranath. Petro-mineralogical study of the Sambalpur granite complex. Calcutta, Geology, 1962-67. Chatterjee, P. K.

552.3

1506.159 Bansode, Wasant Narayan. Petrological and structural studies of granites and associated rocks around Jabalpur, M. P. Jabalpur, Govt. Science College, Jabalpur, 1965-67. Subba Rao, Garapati, Professor and Head of the Department of Geology, Govt. Science College, Jabalpur.

Detailed petrological and structural studies of granites and associated rocks, present in an area of about 25 sq. miles around Jabalpur, are in progress. Mapping and petrographic studies have been completed. From these studies, inferences will be drawn regarding mutual relations of the various rocks, and the mode of emplacement of granites explained.

552.3

1507.160 Mallick, Appurba Kumar. Petrology of the gabbro pluton of Dhenkanal District, Orissa, with special reference to chromite and titaniferous magnetites. Jadavpur, Geological Sciences, 1965-67. Chakraborty, Kanai Lal, Reader.

The petrology of the basic intrusives into granite gneiss is being studied with special reference to the regional structure of the area. The basic rocks contain chromite and titaniferous magnetite lenses. Economic potentialities, mineralogy, chemistry and genesis of these ore deposits will also be studied.

552.3

1508.161 Munshi, Chaman Lal. Studies on the granite in the vicinity of Kangan in South Kashmir with its associated copper mineralization. Jammu & Kashmir, Geology, 1965-67. Wakhloo, Shambu Nath, Professor and Head of the Department.

A number of granite bosses are present in various parts of Kashmir. Out of these, only the Nanga Parbat massif has been studied petrographically. For the present work, the boss at Kangan has been selected for detailed petrographic and petrochemical studies. This granite has an added importance because the country rock in its vicinity, which comprised of cambro-silurain-staktes and phyllites, show some copper mineralization. The study, in addition to working out the petrogenesis of the granite itself, will be directed towards establishing the relationship of copper mineralization to this granite.

552.3

1509.162 Satyanarayana, Kad-Iyala. Studies of granites in Khammam District, A. P. Osmania, Geology, 1966-69. Janardan Rao, Yerramilli, Professor and Head of the Department.

552.3

1510.163 Subbarao, K. V. Syenites and the associated rock types of Kunavaram, District Khammam, Andhra Pradesh. Venkateswara, Geology, 1962-66. Suryanarayana, K. V., Reader.

Structural, mineralogical and petrochemical studies of the syenites and associated rock types of kunavaram have been carried out. It has been observed that the syenites and nepheline syenites of this area are probably plutonic rocks which have been subsequently metamorphosed but still retain their original igneous character.

552.3

Metamorphic Rocks

1511.164 Agrawal, Gopal Ji. Geology of the Himalayan area around Darjeeling, W. B. Banaras, Geology, 1966-68. Rajnath, Professor and Head of the Department.

A detailed study of the petrology of pelitic schists and gneisses of almandine-amphibolite facies has been undertaken. For this, chemical analysis of rocks and various coexisting minerals will be done. X-ray diffraction also will be done to determine the behaviour of aluminium silicates and micas in different grades.

552.4

1512.165 Chakraborty, Kamal Ranjan. A study of regional metamorphism of the area around Kandra, Bihar, with special reference to garnet-biotite equilibria. I. I. T., Kharagpur, Geology & Geophysics, 1962-66. Sen, Sisir Kumar, Asstt. Professor.

Regional metamorphism of pelitic rocks around Kandra, Bihar, has been studied. Mineralogical changes during progression of metamorphism have been discussed. A new reaction has been suggested for the development of sillimanite. Graphical analysis of the phases has been done by Thompson's projection point towards equilibration of the phases. Major element distributions between garnets and biotites have been investigated and it has been found that Mg-Fe distribution ratio depends upon Ca, Mn and Ca/Mn of garnets. An equation has been derived by correlating

Mg-Fe distribution ratio and Ca/Mn to delineate metamorphic grade.

552.4

1513.166 Didwal, Rajinder Singh. Petrological studies of Salkhala series of middle Himalayas. Jammu & Kashmir, Geology, 1965-68. Wakhloo, Shambu Nath, Professor and Head of the Department.

Salkhala formations in Kashmir are a composite suite comprising rocks of varying degrees of metamorphism, and as such, the facies on a regional scale will form an important study to work out the metamorphic evolution. For this purpose, an interesting area in Doda District has been selected, where the intensity of metamorphism is maximum. It is proposed to work out the various phases of metamorphism witnessed by the old formation.

552.4

1514.167 Ray, Sumit Kumar. Structural, stratigraphic and metamorphic study in a part of Simla Himalayas. I.I.T., Kharagpur, Geology & Geophysics, 1966-69. Naha, K., Asstt. Professor.

Detailed mapping of the area between Halog and Simla is being carried out in 2″ to 1 mile scale. Modern methods of structural analysis are being applied to elucidate the structural history and to correlate the structural and metamorphic episodes. An attempt will also be made to elucidate the stratigraphic sequence from the large scale structural geometry.

552.4

1515.168 Virdi, Niranjan Singh. A study of crystalline rocks between Narkanda and Rampur, H. P. Panjab, Geology, 1966-69. Pande, I. C., Professor and Head of the Department.

The area under investigation, extending from Narkanda to the valley of Sutlej, contains rocks belonging to Jutogh, Chails and Infra-Krol Series. It is proposed to map the minor as well as major structures. Oriented as well as unoriented specimens will also be studied to elucidate the tectonic and metamorphic history of the area.

552.4

Sedimentary Rocks

1516.169 Bhattacharya, Subhash Chander. Structure and stratigraphy of the area around Solan, Simla Hills, H. P. I. I. T., Kharagpur, Geology & Geophysics, 1966-68. Niyogi, Dipankar, Asstt. Professor.

Detailed geological and structural investigation has been carried out over an area of about 50 sq. miles around Solan. Recent techniques of air photo interpretation have been used in the course of geological mapping. The stratigraphic, tectonic and sedimentary aspects of the krol formations are under study.

552.5

1517.170 Damle, G. V. Geology of the area around Udaipur with special reference to sedimentation and structure. Aligarh, Geology, 1965-68. F. Ahmad, Professor and Head of the Department.

552.5

1518.171 Diwakar Singh. Geology : Petrology. Banaras, Geology, 1965-66. Mehrotra, M. N., Reader.

The area ranging from 83°-4′-36″ to 83°-11′-30″ and 24°-26′ to 24°-30′ around Kotta and Susnai villages of Mirzapur District, U.P., has been geologically mapped. The mechanical analysis and petrography of the arenaceous horizons have been completed. The study of the argillaceous and calcareous sediments is in progress.

552.5

1519.172 Farrukh Iftikhar. Vindhyan sedimentation in Pannakari area. Aligarh, Geology, 1966-69. Srivastava, V. K., Reader.

552.5

1520.173 Gupta, Anil Kumar. A sedimentological study of Gondawana sediments of central Indian coalfields. Aligarh, Geology, 1965-68. F. Ahmad, Professor and Head of the Department.

552.5

1521.174 Hajela, Avinash Chandra. Petrological investigation of coals and associated sediments in some central Indian coalfields. Aligarh, Geology, 1966-69. Pant, I. D., Lecturer.

552.5

1522.175 Hardas, Mukund Ganesh. Geology of the area, west and south west of Bhuj, Kutch, Gujarat, with special reference to its structure and stratigraphy. Baroda, Geology, 1965-67. Merh, S. S., Professor and Head of the Department.

A detailed sedimentological study has been undertaken to find out the various controls of sedimentation in the area near Bhuj.

552.5

1523.176 Iqbal Hasnain, S. Sedimentological study of oolites in some coalfields of Central India. Aligarh, Geology, 1966-69. F. Ahmad, Professor and Head of the Department.

552.5

1524.177 Kanjilal, Sushant. Geology and sedimentation of krols and tals with special reference to their petrology and economic importance. Banaras, Geology, 1966-68. Bhattacharya, A. K., Reader.

Krols and tals occurring in Dehra Dun and Tehri Districts have recently yielded rich deposits of limestone, dolomite and phosphorite. Detailed petrological and sedimentological studies, and chemical and X-ray analyses will be done to determine the origin and environmental conditions of formation of these deposits and the host rocks.

552.5

1525.178 Kulkarni, Vinayak Narayan. Limestone in Gujarat. Baroda, Geology, 1965-67. Merh, S. S., Professor and Head of the Department.

Various engineering aspects and uses of the limestones of Gujarat are being studied.

552.5

1526.179 Mehta, Prashant. A sedimentological study of Gondwana sediments of central Indian coalfields. Aligarh, Geology, 1965-68. F. Ahmad, Professor and Head of the Department.

552.5

1527.180 Sen, Debaprasad. Sedimentological study of the basal Siwaliks and pre-Siwaliks in Simla foot hills. I.I.T., Kharagpur, Geology & Geophysics, 1966-70. Niyogi, Dipankar, Asstt. Professor.

The study has been taken up to understand the nature of sedimentation of the area and to establish its proper stratigraphic relation, Eocene rocks, as revealed by present study, show a complete transition from shallow marine to continental sediments, Nahans, the basal Siwaliks, show an unusual association of turbidite and non-turbidite.

552.5

1528.181 Siddiqi, Hassan Naseem. A sedimentological study of the Bay of Bengal. Aligarh, Geology, 1965-68. F. Ahmad Professor and Head of the Department and Jhingran, A. G.

552.5

1529.182 Tiwari, Rama Nath. Sedimentology of krols and tals with special reference to their economic importance. Banaras, Geology, 1966-68. Mehrotra, M. N., Reader.

552.5

Economic Geology

Coal Deposits

1530.183 Bose, Pradip Kumar. Geology of the area around Nirsha with special reference to its coal deposits. Jadavpur, Geological Sciences, 1963-66. Mukherjee, Bankim, Reader.

Geology of the area is being studied with special stress upon coal metamorphism. It is proposed to find out the depositional condition of the Gondwana sediments with special reference to the age of the southern boundary fault of the basin.

553.2

1531.184 Datta, Amitbhushan. Stratigraphy, sedimentation and economic deposits of Ib river coalfield, District Sambalpur, Orissa. Calcutta, Geology, 1965-67. Chatterjee, N. N., Professor (Retd.).

553.2

1532.185 Datta, Anilbhusan. Geology of Daltongunj coalfield, Bihar, with special reference to coal. Calcutta, Geology, 1965-69. Chatterjee, N. N., Professor (Retd.).

553.2

1533.186 Ghosh, Arabinda. The physico-chemical and petrographic characters of Karanpura coals, Bihar. Jadavpur, Geological Sciences, 1966-69. Mukherjee, Bankim, Reader.

The stratigraphy of coals in Karanpura area is being investigated. The paleogeographic and paleobiologic conditions during carboniferous age will also be studied.

553.2

1534.187 Moiz, Ahmed Abdul. Correlation of coal seams in Pranhita Godavari Valley coalfield of India. Osmania, Geology, 1963-68. Ramana Rao, Nunna, Lecturer.

Stratigraphical correlation has been established and the Bore hole plan for the areas to be investigated, prepared. Few coal samples have been studied by prosimeta analysis and petrographically. Few sand stone samples have also been studied. These studies are palynological and petrological in nature.

Coalification of coal from the Kothagudium coalfield. Met. Min. Rev. 5(8) ; July '66 : p.21-24.

553.21

1535.188 Razvi, Syed Khalid. Facies and genesis of Godavari Valley coal. Osmania, Geology, 1963-67. Ramana Rao, Nunna, Lecturer.

Petrographic and chemical studies have been carried out on the coal for different coalfields in Godavari

Valley, and microlithotype and rank of coal have been correlated. Facies map, and macropropiles and micropropiles of coal seams from Godavari Valley coalfields have been prepared. The roof forming sand stones of the coal seams have also been analysed petrographically. The nature and distribution of resin, inorganic mineral matter and sclerotia in coal of this field are being investigated.

Rank and microlithotype of coal from Kothagudium coalfield. Met. Min. Rev. April '65.

553.2

1536.189 Subramanian, V. Economic geology of Kalijhora, District Darjeeling. Jadavpur, Geological Sciences, 1966-69. Mukherjee, Bankim, Reader.

It is proposed to study the economic geology of coal deposits with special reference to geochemical, petrological and palynological studies. Sedimentary studies on tertiary and Damuda sediments will also be carried out.

553.2

Ferrous Deposits

1537.190 Kashi Ram. Study of the iron deposits around Jaipur, Rajasthan. Roorkee, Geology, 1965-68. Krishna Kant Singh, Reader.

553.3

1538.191 Radhakrishnan, Cuppala. A study of Veldurti Ghani iron ore deposits. Osmania, Geology, 1966-69. Ramana Rao, Nunna, Lecturer.

553.3

1539.192 Sunil Kumar. Detailed study of the iron ore resources of Sidhi District, M. P. Banaras, Geology, 1966-68. Mukherjee, N. K., Reader.

There is a good deposit of iron ores in the neighbourhood of Sidhi proper. A detailed study of the regional geology and economics of the area has been undertaken to assess its economic potentialities.

553.3

1540.193 Venkateswara Rao, Mulpuri. Origin of iron ores of Byaram, District Khammam, A. P. Osmania, Geology, 1963-67. Janardan Rao, Yerramilli, Professor and Head of the Department.

A Geological map covering an area of 50 sq. miles has been completed and its stratigraphic succession established. Chemical analysis of the ores has also been completed. Some thin and polished sections of the rocks are under study.

(1) The geology of iron ore deposits of Byaram area, District Khammam, A. P. Met. Min. Rev. March '65; and (2) A study of granites from Byaram area, District Khammam, A. P. Min. Met. Fuels. April '66.

553.3

Nonferrous Deposits

1541.194 Basu, Parimal Kumar. Economic geoloy of lead and zinc deposit of Zawas mines. Calcutta, Geology, 1965-68. Murty, M. V. N., Director, Geological Survey of India, Calcutta.

553.44

1542.195 Bhardwaj, Mahesh Chander. The study of uranium minerals and their associates in Singhambhum District of Bihar State. Panjab, Geology, 1966-69. Saxena, M. N., Lecturer.

The radioactive minerals and their associates are being studied by X-rays, fluorescence, spectroscopical and infrared ray analysis. It is found that the radioactive emanations cause radial fractures, discoloration, pleochroic halos and metamictization upon other minerals around uranium.

553.493

1543.196 Lakshmanrao, Sanesi Khandojirao. The mineragraphic and petrographic study of one of the mineralised sections of Khetri copper belt of Rajasthan. Nagpur, Geology, 1964-67. Kilpady, Sripadarao, Professor and Head of the Department.

Khetri copper belt lies in the Jhunjhunu District of Rajasthan. It belongs to the Delhi system of archaens which is composed of quartzites of Alwar, and phyllites and schists of Ajabgarh series. Copper mineralisation is confined to the quartz chlorite garnetiferous schists and andalusite quartz chlorite schists. It is proposed to study the rocks and mineralised portions of the area by the conventional petrographic and mineragraphic methods. These studies of the rock types will include the physical characteristics of minerals and ore indentification by optical and X-ray powder pattern studies. A revised geological map on mineralogical basis will also be prepared.

553.43

1544.197 Paul, Rabindra Nath, Geology of the area around Netra-Ramrama-Sudanhudki, District Balaghat, M. P., with special reference to manganese formations. Jadavpur, Geological Sciences, 1964-68. Roy, Supriya, Reader.

The work is being carried out on the petroloy and mineralogy of the regionally metamorphosed manganese silicate rocks, gondite and the manganese oxide ores of the Netra-Ramrama-Sudanhudki. The petrology of the sorrounding lithic units of the Sausar Series will also be studied in detail.

553.462

1545.198 Purkait, Prodyot Kumar. Geology of the area around Gowari Wadhana, District Chhindwara, Madhya Pradesh, with special reference to the gondites and manganese orebodies. Jadavpur, Geological Sciences, 1963-68. Roy, Supriya, Reader.

The work has been carried out on the petrology and mineralogy of the regionally metamorphosed manganese silicate rocks and the manganese oxides of the Gowari Wadhana. Petro-mineralogical study of the different lithic units of this area has also been done.

553.462

1546.199 Roy, Susanta Kumar. Geology of the area around Jothvad, District Panch Mahals, Gujarat with special reference to the manganese formations. Jadavpur, Geological Sciences, 1962-68. Roy, Supriya, Reader.

The work has been done on the petrology and mineralogy of the contact metamorphic manganese silicate rocks—kodurites—and the manganese oxide ores of the Jothvad mine area. Petrology of the surrounding lithic units—Champaner Series rocks—has also been investigated.

553.462

1547.200 Shrivastava, D. K. Petrogenesis of magnesite and associated ultrabasic rocks of chalk hills, Salem, Madras State. I. I. T., Kharagpur, Geology & Geophysics, 1965-68. Bagchi, T. C., Professor and Head of the Department.

The area has been mapped and the petrological study of the rock types completed. The X-ray diffractograms of olivine, pyroxene, garnet and feldspars have been studied and methods suggested for the ore beneficiation of poor grade magnesite ore. On the basis .of chemical analysis, grading of magnesite ore has been done with the help of a computer. Trend surface study of the dunite, peridotite, pyroxenite and gabbro has also been done with the help of the computer.

553.492

1548.201 Srinivasan, R. Geology of the Kolar gold field area with special reference to structure and metamorphism. Bangalore, Geology, 1964-68. Sreenivas, B. L., Lecturer.

Geology of the area is being investigated with special reference to structure and metamorphism, macro, meso and microfabric analysis, sequence and nature of deformation and structural control of gold-quartz veins. The petrology of amphibolites, ferruginous quartzites, quartz-mica schists, gneisses and granites, dykes and lode rocks will be studied in detail. The vein material facies of metamorphism and their relation to structure, metamorphic evolution and source of mineralization will also be studied.

553.41

1549.202 Srivastava, Devendra Kumar. Petrogenesis of magnesite deposits and associated rocks of Salem, Madras State. I. I. T., Kharagpur, Geology & Geophysics, 1965-68. Bagchi, T. C., Professor and Head of the Department.

It is proposed to study the petrography ; X-ray diffraction of pyroxene, feldspar, magnetite, garnet and olivine ; trend surface maps of dunite, pyroxenite and gabbro ; and beneficiation of magnesite.

553.492

1550.203 Yadav, Bhola Nath. Geology. Banaras, Geology, 1966-68. Mukherjee, N. K., Reader.

The position of nonferrous metals in India is very bad and there is no economic occurrence of tin deposit in the country. Out of all the known occurrences of the metal within the country, the Chakarbandha deposit seems to be more promising. A detailed investigation of the area has been undertaken to assess the economic potentiality of the deposit.

553.453

Building Stone Deposits

1551.204 Jiwan, Jaswant Singh. Evaluation and engineering applications of building stones from North-Western India, including Punjab, Rajasthan and parts of U. P. State. Roorkee, Geology, 1965-68. Mithal, Rajendra Singh, Professor and Head of the Department.

Methods of quarry, testing and sawing building stones, now in use in Mohindergarh and Gurgaon Districts of Haryana, are being studied.

553.5

Earthy Material Deposits

1552.205 Anand, Srimangala Narayan. Gravity studies in Pulivendla Taluq., District Cuddapah, A. P. Osmania, Geology, 1965-68. Bhimasankaram, Vemu Lakshminarayana Subramanya, Reader.

The gravity survey has been conducted in Vemula area to trace the extension of baryte veins.

553.662

1553.206 Baishya, Nalini Charan. Petrology, origin, suitability as concrete aggregate of the Dhalbhumgarh gravels and groundwater of the area. I.I.T., Kharagpur, Geology & Geophysics, 1964-68. Bagchi, T. C., Professor and Head of the Department.

Detailed geological mapping of the area has been completed. Mechanical analysis of the collected samples is in progress. Groundwater data has been collected for different seasons to note the fluctuations of the water level. D. T. A. of the clay samples will be done. Electrical resistivity survey for studying the groundwater conditions of the area is also planned.

553.62

1554.207 Ballurkar, Ashok. Occurrence and origin of barytes in District Khammam, A. P. Osmania, Geology, 1964-68. Ramana Rao, Nunna, Lecturer.

553.662

1555.208 Chaudhuri, Jatishcharan. A study of the salt deposits in Rajasthan. Calcutta, Geology, 1960-67. Independently.

553.63

1556.209 Mehrotra, Gopal Swarup. The genesis of black cotton soil and its influence on the behaviour of construction. Roorkee, Geology, 1964-67. Mithal, Rajendra Singh, Professor and Head of the Department.

553.61

Aqueous Deposits

1557.210 Chandrasekharan Pillai, K. Radioactive and trace elements in aquatic environments. Bombay, Atomic Energy Establishment, Trombay, 1965-68. Ganguly, A. K., Head of the Health Physics Division, Atomic Energy Establishment, Trombay.

Elemental distribution studies in a limnological environment—Chambal river—have been completed. The distribution of Li, Na, K, Rb, Ca, Sr, Mg, Zn, Cu, Fe, Co, Ni, Mn, Cr, Cl, PO_4, SO_4, SiO_2, Ra, Th, U, and Cs^{137} in the three matrices—river water, aquatic organisms and bottom sediments—have been studied.

553-78

1558.211 Chowdhary, G. C. Engineering geology and underground water. Banaras, Geology, 1966-68. Rajnath, Professor and Head of the Department.

It is proposed to explore ways of fuller extraction of underground water, stored in the deposits made by the river Ganges in Varanasi region of the Indo-Gangetic Plains, on the basis of geological structures, hydrological data and establishment of aquifer zones. Hydrological data, surface run off and percolation in the ground are being analysed. The alluvial deposits throw light on the geological sequence and sedimentation of the area and are expected to help establish the trend of Gangetic meander. The water bearing capacities of the aquifers will be calculated, and a plan for maximum extraction without interfering with the general water table will also be scaled.

553.79

1559.212 Gupta, Bishan Lal. Ground water studies in the Districts of Muzaffarnagar and Meerut, U. P. Roorkee, Geology, 1964-67. Singhal, Brij Bhukan Saran, Reader.

Subsurface geological map has been prepared on the basis of the lithological logs. Pump test analyses from aquifer have been carried out to determine the aquifer constants. Detailed chemical analyses of water samples from shallow and deeper aquifer are being carried out. Quantitative assessment of ground water potentialities will also be made.

553.79

ENGINEERING

Applied Mechanics

Materials, Properties & Tests

1560.1 Arora, Y. L. Studies on Zn S : Cu phosphors. Agra, Defence Research Laboratory (Materials), Kanpur, 1962-66. Nanda, J. N., Director, Defence Research Laboratory (Materials), Kanpur.

The phosphorescence of Zn S : Cu phosphors, prepared in the laboratory, has been measured from —78°C to 150°C. An interpretation has been given for the glow curves and the observed phosphorescence. It has been shown that movement of holes from the valence band play a decisive role. Certain incidental observations have also been analysed.

620.182

1561.2 Chakraborty, Paresh Nath. Bonding action of some Indian clays. I. I. T., Kharagpur, Mechanical Engineering, 1964-68. Belgaumkar, B. M., Professor and Head of the Department.

The object of the research is to find satisfactory alternatives for clays for foundry sand bonding by studying the foundry characteristics of known deposits of different clays as well as methods to improve the quality of the clay for bonding purposes.

620.15

1562.3 Chandrasekharan, E. C. Investigation on structure, texture and consistency of soils and their importance in soil stabilization. Madras, College of Engineering, Guindy, 1966-70. Independently.

There is a lack of understanding and knowledge regarding the influence of structure, texture and consistency of soils on their susceptibility to different types of treatment and placement. The aim of the present research work is to study these characteristics and evolve procedures and techniques for evaluation of the influence of these characteristics in soil stabilization work.

620.191

1563.4 Chatterjee, Rabindranath. Problems of non-homogeneous and porous elastic material. Visva-Bharati, Mathematics, 1964-67. Sen, B. B., Professor and Head of the Department.

Several torsion and flexure problems of plates, beams and shells of non-homogeneous elastic materials have been solved. Besides these static problems, torsional vibrations of homogeneous slabs, subjected to impulsive loading on one of the faces, have also been considered.

620.11282

1564.5 Chaturvedi, Brijendra Kumar. Ferromagnetic materials. I.I.T., Bombay, Electrical Engineering, 1964-67. Bhagavat, Gopal Krishnamurthy, Professor.

The study deals with the spin-wave resonance for certain ferromagnetic materials in the form of very thin film on glass substrate. The films are biased by a D.C. field and simultaneously irradiated by a microwave field inside a microwave cavity. The microwave field absorption study will give a measure for the exchange integral and exchange constant for the material.

620.1129

1565.6 Das, Madhusudan. Development of photoelastic technique. Calcutta, B. E. College, Howrah, 1964-67. Chatterjee, P. N., Lecturer in Civil Engineering, B. E. College, Howrah.

620.1129

1566.7 Desai, S. M. Studies in the corrosion of aluminium alloys. Gujarat, Chemistry, 1966-68. Desai, M. N., Reader.

The corrosion of 65s aluminium alloy is being investigated in acidic, alkaline and neutral solutions. Various inhibitors have been studied and the effect of the corrosive medium, time and the variation of inhibitor efficiency with the concentration of the inhibitors observed. The action mechanism of inhibitors is being studied by electrochemical methods.

620.186

1567.8 Desai, Yashwant Bhagwatsinh. Corrosion of aluminium and its inhibition. Gujarat, Chemistry, 1965-68. Desai, M. N., Reader.

The effect of temperature on the corrosion of Al-2s, Al-57s and Al-65s has been investigated. Various inhibitors are being studied to inhibit the corrosion of these Al-alloys in acidic and alkaline solutions. The effect of temperature on inhibitor efficiency is also being investigated. The atmospheric corrosion of metals and alloys is being investigated in industrial atmosphere.

620.186

1568.9 Dev, Provash Chandra, Corrosion of aluminium bearing alloys. Jadavpur, Chemical Engineering, 1966-69. Mukherjee, R. N., Professor.

The use of aluminium for replacing alloys based o other scarcely available non-ferrous metals, like Cι Zn etc., is of utmost importance in India. The objec of the present investigation is to study the corrosio resistance of different aluminium bearing alloys i various lubricating media under load and no-loa conditions.

620.18

1569.10 Dube, G. P. Impact problems in plasticity. I.I.T., Delhi, Applied Mechanics, 1967-68. Karunes, B., Professor.

Experiments are being designed to study plastic deformation of long membranes and bars, under blast loading, to verify and advance methods of theoretical analysis. The analytical and numerical solutions of stress, deformation, discontinuities and their movements in Ramberg-Osgood material are also being worked out in accordance with the deformation theory of plasticity.

620.11233

1570.11 Ghosh Roy, Malay Kanti. Problems in engineering elasticity. Bombay, Chemical Technology, 1964-67. Joshi, M. V., Professor.

The influence of a bracket on the stress distribution in a fixed beam and a plane stress analysis has been investigated. Boundary conditions approximate a plate bracketed beam with fixed ends. A penny shaped axisymmetric crack inside a finite axisymmetric elastic medium with internal symmetric loading on crack surfaces is also under study.

620.1123

1571.12 Gopalacharyulu, S. Variational methods for problems of elasticity, plates and shells. I.I.T., Bombay, Mechanical Engineering, 1963-66. n.g.

(1) Modified fourier series for clamped beams and plates. Trans. ASME. 1962 ; (2) A combined method for clamped plates using modified fourier series. ibid. 1963 ; (3) Large deflections of clamped plates using modified fourier series. ibid. 1965 ; and (4) Clamped semi-infinite rectangular plates. ibid. 1966.

620.11282

1572.13 Gurmukh Singh. Studies on development of yield criteria and its applications in elasto-plastic and orthotropic materials. Agra, Forest Research Institute, Dehra Dun, 1965-68. Sekhar, A. C., Officer-in-Charge. Timber Mechanics Branch, Forest Research Institute, Dehra Dun.

It is intended to extend the existing theories of yield criteria of isotropic materials to elasto-plastic and orthotropic materials. The application of the theory, so developed, in case of stresses in plates and shells etc., and the influences due to strain-hardening, time-hardening effects, will be studied.

620.192

1573.14 Jain, H. C. Studies on mechanics and functional behaviour of laminated constructions of orthotropic materials. Agra, Forest Research Institute, Dehra Dun, 1965-68. Sekhar, A.C., Officer-in-Charge, Timber Mechanics Branch, Forest Research Institute, Dehra Dun.

The purpose of the study is to predict by mathematical assumptions and derivations, the mechanics and functional behaviour of laminated material in terms of the known characteristics of individual orthotropic laminates with their principal axes of elastic symmetry orientated at different angles to principal directions of load applications.

620.192

1574.15 Lakshminarayana, C. N. Studies on stress distribution in pressure vessels and machine elements. I.I.T., Kharagpur, Mechanical Engineering, 1959-67. Belgaumkar, B. M., Professor and Head of the Department.

The stress distribution in about 18 thick cylindrical shells of different thickness ratios with hemispherical ends has been determined by 3-dimensional photoelasticity and results have been compared with theoretical solutions. The stress distribution in 20 tooth forms of 20° involute agma spur gear teeth has also been determined by photoelasticity. A method of calculation of the root stress and strength factors for their design is being suggested.

(1) Jour. App. Sci. Res. 3(A) ; 1953 : p.415-428 ; (2) Institute of Mechanical Engineers, London. Proceedings of symposium on pressure vessels research, Jan.'61. p. 127-134 ; (3) Jour. Sci. Engg. Res. 2(1) ; 1963 : p.191-204 ; and (4) Jour. Sci. Engg. Res., I.I.T., Kharagpur. 5(I) ; 1961 : p.111-124.

620.11282

1575.16 Maharaj Kumar, V. Fatigue of materials. I.I.T., Delhi, Applied Mechanics, 1966-69. Karunes, B., Professor.

It is intended to study and develop analytical methods for designing members subjected to fatigue by making use of, and also advancing the concept of cumulative damage in repetitive loading.

620.1123

1576.17 Mukhopadhyay, A. K. Basic properties of materials. I.I.T., Delhi, Applied Mechanics, 1966-68. Karunes, B., Professor.

The elastic hysteresis and changes in the hysteresis loop due to repetitive loading are being measured and studied with a view to standardise their mechanical properties.

620.1129

1577.18 Natarajan, R. Nonlinear theory of sandwich shells. I.I.T., Delhi, Applied Mechanics, 1966-69. Mirza, S., Assoc. Professor.

It is proposed to obtain the equations for three layered orthotropic shell with rigid core under finite deformation and with temperature gradient across the thickness of the shell using curvilinear co-ordinates with tensor approach. An attempt will be made to simplify the problem with homogeneous isotropic material. The equations will also be applied to a spherical or conical shell.

620.11281

1578.19 Pandey, Braj Bhusan. Weathering characteristic of bitumen. I.I.T., Kharagpur, Civil Engineering, 1966-68. Venkatasubramanian, V., Asstt. Professor.

The object of the investigation is to evolve a suitable measure for weathering characteristic of bitumens. The transmittance wavelength plot of a solution of bitumen in benzene is a characteristic property of a bitumen and any change in this property due to weathering will be reflected in the curve in the form of disappearance of some original peaks. A measure of weathering is proposed to be worked out on these lines.

620.196

1579.20 Pandey, S. N. The electrochemical behaviour of galvanic couples in corrosion inhibited solution. Agra, Defence Research Laboratory (Materials), Kanpur, 1964-67. Sanyal, B., Principal Scientific Officer, Defence Research Laboratory (Materials), Kanpur.

A new technique and new concept for critical potentials of corrosion inhibitors, e.g. benzoate, of mild steel have been developed. Cathodic polarisation and electron diffraction technique have been used to explain the role of O_2 in passivation by oxidative anions, like nitrite and chromate.

620.1122

1580.21 Pandya, Bankim A. Study of corrosion of metals. Gujarat, Chemistry, 1964-68. Trivedi, A. M., Reader.

The research comprises studies on (i) Incrustation corrosion in pipes carrying potable water—Water supply from the university campus has temporary hardness which causes heavy incrustation in the pipes. This results in the gradual depletion of water supply. The problem is being studied from various angles, such as, the inhibition of incrustation and formation of fluffy incrustation which can be easily washed out ; (ii) Atmospheric corrosion of metals at Ahmedabad—semiarid and industrial atmosphere, and at Bulsar—saline and humid atmosphere ; and (iii) Corrosion of metals, like aluminium, iron, brass, copper etc., in the immersed condition and the influence of inhibitors on it.

620.17

1581.22 Patel, B. M. Studies in corrosion of aluminium alloys : Atmospheric corrosion of metals at Kandla and Patan. Gujarat, Chemistry, 1966-68. Desai, M. N., Reader.

The corrosion characteristics of Al-2s (annealed) and Al-57s are being studied in acidic and alkaline solutions. A study of the effect of the addition of various cations and anions in inhibiting the corrosion of these alloys is in progress. The corrosion and its inhibition in sulfuric acid will also be studied by electrochemical methods. The atmospheric corrosion of metals at Kandla—marine climate, and Patan—urban atmosphere is under study.

620.186

1582.23 Ram Lal. Studies on problems of stress distribution in orthotropic elasto-plastic materials. Agra, Forest Research Institute, Dehra Dun, 1966-69. Sekher, A. C., Officer-in-Charge, Timber Mechanics Branch, Forest Research Institute, Dehra Dun.

The purpose of the study is to bring to light some fresh contributions to the knowledge of stress distribution in orthotropic and elasto-plastic materials having a limit of plastic flow. These will be developed on the basis of modified generalised Hooke's law and verified experimentally, where necessary, under different orientations and notches etc., at different positions.

620.192

1583.24 Rana, S. S. Studies in corrosion of copper. Gujarat, Chemistry, 1964-67. Vaidya, B. K., Professor.

The corrosion of copper in acidic, alkaline and neutral solutions is being investigated. Attempts are being made to inhibit the corrosion of copper by the use of inhibitors. The effect of pH, the concentration of the corrosive medium and the effect of inhibitor concentration on the efficiency of various inhibitors will be studied. The action mechanism of inhibitors will also be studied by electrochemical measurements. The atmospheric corrosion of metals and alloys is being studied at Cambay.

620.182

1584.25 Ratwani, M. M. Creep in shells. I. I. T., Delhi, Applied Mechanics, 1966-69. Mirza, S., Assoc. Professor.

Creep law for different concrete mixes will be developed on the basis of rheological models. The creep law developed for uniaxial stress will be used to study creep in concrete shells, both for membrane theory and bending theory.

620.11233

1585.26 Roy, S. K. Corrosion studies of alloy steels by potentiostatic method. I. I. T., Kharagpur, Metallurgical Engineering, 1966-68. Sircar, S. C., Asstt. Professor.

The effect of alloying elements and heat treatment on the corrosion resistance properties of steels is being studied. The unconventional potentiostatic method has been employed so that some light is also thrown on the mechanism of corrosion.

620.172

1586.27 Sekhon, Gursharan Singh. Determination of universal machinability index. I. I. T., Delhi, Mechanical Engineering, 1965-68. Moore, N. P. W., Visiting Professor and Head of the Department.

The work is concerned with the determination of more precise definition and evaluation of machinability index of a metal. Two criteria are being investigated, namely, cutting forces and tool wear. Special attention will be paid towards the effect of chip curl on the mechanics of orthogonal chip formation, and the effect of controlled pressures and temperatures on friction and wear of clean, nascent surfaces.

620.169

1587.28 Shah, C.B. Studies in corrosion of aluminium and its alloys. Gujarat, Chemistry, 1964-68. Desai, M. N., Reader.

The corrosion characteristics of 57s aluminium alloy in various corrosive media are being investigated. A number of organic and inorganic substances have been tested as corrosion inhibitors. The performance of inhibitors is being studied under a wide variety of conditions. The action mechanism of inhibitors is also being studied by potential and polarization measrurements.

620.166

1588.29 Shah, Vithaldas Khemchand. Studies in corrosion of brass. Gujarat, Chemistry, 1966-68. Desai, M. N., Reader.

The corrosion and corrosion inhibition of 70/30 brass have been investigated in various corrosive liquids.

Potential measurements are in progress to study the action mechanism of inhibitors. The inhibitors, which are effective for 70/30 brass, are also being tested for Al-2s in acidic, alkaline and neutral solutions. The atmospheric corrosion of metals and alloys is being studied at Dandi—sea climate.

620.182

1589.30 Shah, Y. C. Atmospheric corrosion of typical metals at Ahmedabad and prevention and dezincification of brasses. Gujarat, Chemistry, 1962-67. Desai, M. N., Reader.

The corrosion of different types of brasses is being studied in acidic, alkaline and neutral solutions under a wide variety of conditions. Attempts are being made to inhibit the corrosion and dezincification of brass by the use of inhibitors. The action mechanism of inhibitors will be investigated by galvanostatic method. The work on the atmospheric corrosion of metals and alloys is being done at Ahmedabad.

620.182

1590.31 Singhania, Ganga Krishna. Studies on corrosion of metals by gaseous pollutants. Agra, Defence Research Laboratory (Materials), Kanpur, 1963-67. Sanyal, B., Principal Scientific officer, Defence Research Laboratory (Materials), Kanpur.

The mechanism of atmospheric corrosion has been studied under laboratory conditions by chemical, electrochemical and X-ray/electron diffraction methods. Corrosion rates increase with increasing concentration of corrosive gas (SO_2), temperature, humidity and period of exposure in polluted and subsequently pollution-free atmosphere. The behaviour of metals towards mixtures of corrosive gases has also been studied.

Labdev Jour. Sci. Tech. 3(2) ; 1965 : p.104.

620.162

Applied Acoustics

1591.32 Grover, Gopal Krishan. An investigation of the damped vibration absorbers incorporating means for tuning optimization. Roorkee, Mechanical Engineering, 1964-67. Shankar Lal, Professor and Head of the Department.

The research deals with the study of a new type of the variable tuning damper. A self optimising control system has been designed and the feasibility of such a design for automatically adjusting the tuning to the optimum position has been demonstrated.

620.21

Mechanical Vibration

1592.33 Juneja, B. L. Wave propagation through nonlinear continuous media. I. I. T., Delhi, Mechanical Engineering. 1964-67. Moore, N. P. W., Visiting Professor and Head of the Department.

The research comprises the study of (1) Growth of weak discontinuities in general quasi-linear hyperbolic systems ; (2) Growth and strength of curved wave fronts in initially, arbitrarily strained hypoelastic material ; (3) Growth of wave in initially strained and unstrained nonlinear couchy-elastic materials ; and (4) Rod theory for nonlinear elastic material and wave propagation.

620.31

Systems Engineering

1593.34 Kunhiraman Nair, K. P. Replacement strategies for large systems. I. I. T., Bombay, Mechanical Engineering, 1964-67. Independently.

A few novel replacement strategies have been suggested for use in the replacement of failing type of items in large systems. For predicting the behaviour of the strategies, mathematical models have been constructed. Optimal strategies have also been obtained considering the costs relevant to the situation. Work on system reliability is in progress.

Oper. Res. 13 : p.279-290.

620.7

Hydraulic Power Engineering

1594.35 Jategaonkar, Vinayak Laxman. Investigation in the characteristics of water power system and various modes of controls for stability. Bombay, Chemical Technology, 1964-67. Joshi, M. V., Professor.

The characteristics of water power system are being studied. The response of the system to a step and cyclic disturbance is being derived. Different types of controls and their effect on the system shall determine the extent of controllability and the stability of the system. Equations connecting the system and the controller will be derived and an actual water power system will be checked for its performance in the light of the above equations.

621.2

1595.36 Krishnan, A. Vibration and cavitation studies in hydraulic machinery. I. I. T., Kharagpur, Mechanical Engineering, 1960-67. Belgaumkar, B. M., Professor and Head of the Department.

An attempt is being made to study experimentally the influence of vibrating hydrofoil sections on flow conditions, such as, separation and cavitation around them. A mathematical model is also being developed for an arbitrary section vibrating in a flow field of a real fluid.

621.26

Electrical Engineering

Generation & Transmission of Electric Power

Dynamoelectric Machinery

1596.37 Desai, Bipin Gulabbhai. Single phase induction motor with asymmetrical squirrel cage rotor. I. I. T., Bombay, Electrical Engineering, 1963-66. Independently.

It is proposed to investigate a new principle of starting single phase induction motors. Equations have been derived for the complete dynamic performance and are being solved with the help of digital and analogue computers. The design aspects are also being studied. Experimental machines have been built up to verify the theory.

621.3136

1597.38 Jain, S. K. Behaviour of schrage motor under abnormal conditions of operation. Roorkee, Electrical Engineering, 1964-68. Ray, L. M., Assoc. Professor.

It is proposed to analyse the operation of scharge motor under various imbalances, such as, wattage imbalance, imbalance in secondary circuit due to brush-rocker etc. Steady state performance equations have been deduced for the purpose and verified experimentally.

621.3134

1598.39 Joseph, Henry. Self synchronising characteristics of alternators and their influence on system performance and design. I. I. T., Bombay, Electrical Engineering, 1964-67. Bedford, R. E., Professor and Hariharan, Mailrangam Vaidyanathan, Asstt. Professor.

A special type of excitation regulator has been designed to improve the pulling-in performance of an alternator. Its performance is being studied when fitted to a laboratory machine, the value of its parameters per unit being of the same order as that of a big machine.

Experimental results will be compared with those obtained from theoretical work.

621.3134

1599.40 Ragade, R. K. Studies in differential games and their applications to optimal control of plants with uncertainty. I. I. T., Kanpur, Electrical Engineering, 1965-67. Sarma, I. G., Asstt. Professor.

The aim of the study is to provide a unified framework within which the subject of optimal control of plants with uncertainty can be studied. It comprises formulation of considerations for stochastic differential games, and formulation of certain game and programming problems through functional analysis.

631.313

1600.41 Subbayyan, Rangaswamy. Circuit equations as applied to electric machines. Madras, P. S. G. Charities College of Technology, Peelamedu, 1958-66. Independently.

The object of the research is to formulate a unified system of machine analysis on the basis of physical insight. The theoretical investigations have been completed and the relevant equations and theorems formulated. The experimental investigations are in progress.

621.313

Transmission Systems

1601.42 Chandrasekharan, P. C. State space approach to power system analysis. Madras, Electrical Engineering, 1965-68. Independently.

The work deals with the state space formulation of large power systems. It involves building up of state space models for the components. These models constitute a family of linear algebraic and differential equations. They have been linked by using graph theoretic concepts. The dynamic response of the entire system is being examined for small variation of system parameters using Eugen value perturbations.

621.3191

1602.43 Dasgupta, Makhanlal. Power system analysis. Calcutta, Engineering, 1963-67. Independently.

621.3191

1603.44 Sanyal, Amar. Power system analysis with digital computer. Calcutta, Applied Physics, 1965-67. Sengupta, A. K., Sir R. B. Ghose Professor and Head of the Department.

621.3191

Lines & Circuitry

1604.45 Datta, Sambhunath. Relaxation methods as applied to electrical circuits and networks. Calcutta, Applied

Physics, 1965-67. Sengupta, A. K., Sir R. B. Ghose Professor and Head of the Department.

621.3192

1605.46 Mukerji, Saurabh Kumar. Linear electromagnetic theory of the solid rotor induction machine. I. I. T., Bombay, Electrical Engineering, 1962-66. Mukherji, Kesab Chandra, Professor and Head of the Department.

An electromagnetic field theory has been developed for solid rotor induction machines with particular reference to 'tooth ripple phenomena' and 'end-effect'. The former arises due to the slotted structure of the laminated stator and the latter due to the finite axial length of the solid rotor.

621.31921

1606.47 Nene, Vilas Dattatray. Study of dynamic behaviour of induction machines. I. I. T., Bombay, Electrical Engineering, 1964-67. Bedford, R. E., Professor.

The study of 'recurrent transients' set up in induction motor when an anti-parallel connection of SCR's is connected in series with one or all lines of the motor has been undertaken. The ring counter type three phase inverter as a drive for induction motor will also be studied.

621.31921

1607.48 Raghunathji, B. Some studies on reluctance machines. I. I. T., Kharagpur, Electrical Engineering, 1966-68. Krishnamurthy, M. R., Asstt. Professor.

The research deals with the starting and running performance of solid pole reluctance machines. The analysis is based on field theory. The predictions based on theory will be compared with those based on experiments.

621.31921

1608.49 Ramachandran, K. Ferroelectric materials : Preparation and applications. I. I. T., Kharagpur, Electrical Engineering, 1966-68. Kesavamurthy, N., Professor.

The study aims at the preparation of a ferroelectric material, both crystalline and ceramic. It also includes the derivation of a satisfactory theory for the phenomenon of ferroelectricity and its verification by experimental results. This material has a wide variety of practical applications and circuits are being designed with the help of this material.

621.31921

1609.50 Sastry, V. V. Studies on speed changing single phase induction machines. I. I. T., Kharagpur, Electrical Engineering, 1965-67. Krishnamurty, M. R., Asstt. Professor.

The study brings out the speed changing of single phase cage rotor induction motor by changing the poles. Experimental results have been verified by theoretical predictions.

621.31921

1610.51 Sreenivasan, R. Some studies on speed changing A. C. machines, I. I. T., Kharagpur, Electrical Engineering, 1966-68. Krishnamurthy, M. R., Asstt. Professor.

The work attempts to present discrete speed changing machines for use in A. C. supplies. The speed changing is done by changing the number of poles. The theoretical predictions have been verified by experiments in all the cases.

621.31921

Electrical Measurements

1611.52 Raghu Nath. Design and development of the transistorised instruments. Banaras, Electrical Engineering, 1966-69. Banerjee, S. S., Reader.

The transistorised field strength meter has been designed and constructed which can be used without any external aerial to be carried from place to place for the measurement. The effect of ferrite rods on the area affected by the inductance coils is being studied.

621.374

Electronic & Communication Engineering

Microwave Electronics

1612.53 Jitendra Kumar Singh. Effect of materials on the propagation of microwaves. Banaras, Electrical Engineering, 1965-67. Banerjee, S. S., Reader.

The study is being done on the radiation pattern of microwave dielectric horn radiator. The effect of defocussing the feed in a microwave paraboloidal antenna system is also being investigated. The absorption of microwaves due to water drops has been studied to find out the effect of rain on the propagation of microwaves.

Def. Sci. Jour. 16(2) ; Apr. '66.

621.38131

1613.54 Pal, Prafulla Chandra. Effect of radiations on the dielectric properties of matter for various frequency ranges. Jabalpur, Govt. Engg. College, Jabalpur, 1965-67. Independently.

621.381336

1614.55 Rajeswari, Bangalore Viswanath. Parallel plate dielectric wave guides. I. I. S., Bangalore, Electrical Communication Engineering, 1965-68. Chatterjee, S. K., Professor.

The study of the different kinds of modes and the radiation field when a parallel plate dielectric wave guide is excited by an infinite line source has been undertaken at microwave frequencies. The theoretical solution in the form of infinite integrals is being evaluated by methods of contour integration. Experimental verification is also being done.

621.381331

1615.56 Ramakrishna, Jayanti. Microwave plasma device. I. I. T., Bombay, Electrical Engineering, 1966-68. Bhagavat, Gopal Krishnamurthy, Professor.

It is proposed to study the interaction of microwaves with plasma to understand the propagation of backward waves and develop a microwave device.

621.3813

Circuit Electronics

1616.57 Chatterjee, Pralay Kumar. Studies on the role of feedback in quantized modulation systems. I. I. T., Kharagpur, Electronics & Electrical Communication Engineering, 1962-67. Das, J., Professor.

Some new techniques for the A/D conversion have been developed. Improved coders using signal feedback have increased the overall coding efficiency of the A/D converters. Practical delay line PCM coders and $\Delta - \Delta$ modulation systems have been experimented with and their superiority has been established.

(1) Simple delay line PCM coder. Elec. Let. 1966 : p.21-22 ; (2) Reducing quantising noise in PCM coders. ibid. 1966 : p.22-23 ; and (3) A simple coder with improved quantizing noise. JITE. 1966 : p.77-88.

621.381535

1617.58 Dave, M.P. Hall effect and its application as a phase comparator. Roorkee, Electrical Engineering, 1966-67. Rao, T. S. M., Professor.

The method of compensation against the effect of magnetoresistance and second harmonic output are under consideration.

621.3815364

1618.59 Dikshit, Krishna Datt. Study in time varying circuits. Allahabad, Applied Physics, 1959-67. Chakravarty, N. B., Asstt. Professor of Physics & Meteorology, Indian Institute of Technology, Kharagpur.

Investigation has been carried out on parametric amplifiers and a number of methods for parametric amplification, employing lower frequency pumping, have been suggested. Certain problems of travelling waves parametric amplifiers have also been studied. Experimental observations on parametric subharmonic oscillator are being taken.

621.3815

1619.60 Jain, N. C. Network theory. Roorkee, Electronics & Communication Engineering, 1965-68. Manohar Lal, Reader.

It is the study of network synthesis based on orthogonal network solutions.

621.3815

1620.61 Kohli, D. R. Transient phenomena in rotor-fed shunt commutation mechanics. Roorkee, Electrical Engineering, 1964-68. Roy, L. M., Assoc. Professor.

Transient currents and torques in rotor-fed shunt commutator machines due to switching and sudden loading and unloading are being studied both experimentally and theoretically. The effect of design parameters as well as the operating conditions on these transients will also be investigated.

621.3815

1621.62 Mendonca, Harold. Mechanism of a cesium diode. I. I. T., Bombay, Electrical Engineering, 1965-67. Bhagavat, Gopal Krishnamurthy, Professor.

Work is being done on the thermionic energy converter and, in particular, the cesium diode. A general expression of efficiency, both for the low pressure and high pressure energy converter, is being derived. Experiments will also be conducted on the mechanism of the cesium diode.

621.3815122

1622.63 Ram Saran. Design and development of transistorised electronic devices suitable for use in power systems. Banaras, Electrical Engineering, 1966-69. Banerjee, S. S., Reader.

Transistorised electronic switches are being developed for use in power systems. They are being designed for variable duration and high frequencies.

621.381537

1623.64 Ram Shabd Singh. Design and development of transistorised electronic instruments. Banaras, Electrical Engineering, 1965-67. Banerjee, S. S., Reader.

Electronic and transistorised wattmeters are being designed and constructed. Triodes and pentodes have been used as multipliers. Suitable circuits are also being designed to widen the square law region in the characteristics of the transistors.

621.38152

1624.65 Sarma, P. S. Power gain and band width of stagger tuned transistor amplifier stages. I. I. T., Kanpur, Electrical Engineering, 1965-68. Venkateswaran, S., Professor.

The relationships between operating power gain and band width of an active two-port network will be developed with particular reference to single stage stagger tuned transistor amplifiers which are non-unilateral. The theoretical curves have been plotted and experimental verification is being carried out.

621.381535

Computers

1625.66 Mani, Vallapuzha Subramaniam Venkatasubramaniam. Transistorised units for analog computers. I. I. S., Bangalore, Electrical Communication Engineering, 1965-68. Nagaraja, N. S., Asstt. Professor.

The investigation aims at the realization of transistorised operational amplifiers and other units, using indigenous components and devices, which can substitute those using vacuum tubes in an existing analog computer. The problem of drift in transistorised D. C. amplifiers and other low frequency phenomena in transistors will also be investigated.

621.381957

1626.67 Sahasrabuddhe, H. V. Sensitivity study of discrete physical systems. I. I. T., Kanpur, Electrical Engineering, 1966-68. Kesavan, H. R., Professor and Head of the Department.

Algorithms for computation of the sensitivities of system response to its parameters have been developed. Design criteria for both sensitive and insensitive systems and for reliability are being developed. A digital computer programme for design oriented analysis is a possible development.

621.3819533

1927.68 Tripathi, J. N. Analog digital converters. Roorkee, Electronics & Communication Engineering, 1965-68. Biswas, N. N., Professor.

621.381958

Radio

Wave Propagation & Transmission

1628.69 Bisht, M. S. R. F. spectroscopy. Allahabad, Applied Physics, 1959-67. Ghosh, Satyendra Nath, Professor.

The NMR spectrometer has been set up for the study of proton resonance and observations for night shift etc., are being made. Studies on the propagation of radio waves, particularly in the field of V. L. F. i.e. whistlers, have also been carried out. Work is in progress for the development of video recording tapes and switching gas tubes.

621.38411

1629.70 Chattopadhyay, Kalipada. Atmospheric radio refractive meteorological factors in the tropospheric radio and radar propagation problems. Calcutta, Radio Physics & Electronics, 1963-68. Independently.

621.38411

Circuitry

1630.71 Anand, Gargeshwari Venkatasubbiah. Nonlinear oscillations. I.I.S., Bangalore, Electrical Communication Engineering, 1965-67. Ramakrishna, Basava Sri, Professor.

The nonlinear character of oscillations of stretched strings is being studied with reference to forced oscillations, stability, initial value problem and subharmonic oscillations.

Nonlinear resonance in stretched strings with viscous damping. Jour. Acoust. Soc. America. 40 ; 1966.

621.384128

1631.72 Ghosh, Mrinal Kanti. Networks and systems : On equivalent network theory and synthesis of equivalent networks. Calcutta, Radio Physics & Electronics, 1966-68. Sen, Jayanta K.

621.38412

1632.73 Guha, Kabindranath. Networks and systems : On system and network theories and their applications. Calcutta, Radio Physics & Electronics, 1966-69. Sen, Jayanta K.

621.38412

1633.74 Prabhakar, Anantharamiah. Generalised topological formulae for linear network functions. I.I.S., Bangalore, Electrical Communication Engineering, 1962-67. Chandrashekhar Aiya, S. V., Professor and Head of the Department.

Topological formulae have been derived for the general class of linear time invariant networks whose graphs may not have branch admittance or impedance matrices. The formulae involve the listing of subgraphs known as tree-cotrees, and the determination of the sign associated with each tree-cotree.

(1) Elec. Let. 2(2) ; Feb. '66 : p. 75–77 ; and (2) Trans. IEEE. CT-11 (3) ; Sept. '64 : p.412-413.
621.384128

Noise Eliminators

1634.75 Bhanu Murthy, Gurram. The amplitude parameters of atmospheric radio noise. I.I.S., Bangalore. Electrical Communication Engineering, 1966-69. Chandrashekhar Aiya, S. V., Professor and Head of the Department.

It is proposed to study the various amplitude parameters, like peak, quasi peak, average etc., of atmospheric radio noise bursts and their variations, both individual and mutual. The work is expected to provide a better picture of the mechanism of the growth and decay of thunderstorms, in addition to the useful noise data for many of the engineering communication systems.
621.384133

1635.76 Bhat, Sediyapu Jayarama. Atmospheric noise in the VHF band. I. I. S., Bangalore, Electrical Communication Engineering, 1966-68. Chandrashekhar Aiya, S. V., Professor and Head of the Department.

In a place, like Bangalore, significant atmospheric noise can be expected in the VHF range during as many as three seasons of the year. It is proposed to study the phenomena with special reference to its interference potential to several communication services in the band.
621.384133

1636.77 Datta, Apurbakumar. Carrier lock and sideland lock techniques in coherent reception. Calcutta, Radio Physics & Electronics, 1963-67. Chakrabarti, N. B., Lecturer.
621.384133

1637.78 Ramaswamy, K. Lightning flash simulation. I.I.S., Bangalore, Electrical Communication Engineering, 1966-68. Chandrashekhar Aiya, S. V., Professor and Head of the Department.

The atmospheric noise caused by the lightning flashes, has been found to have a particular probability distribution in amplitude, pulse duration and repetition. An attempt is being made to study these distributions.
621.384133

1638.79 Srinivasan, Ramakrishna. Studies of auditory faculty from decision theory approach. I.I.S., Bangalore, Electrical Communication Engineering, 1965-68. Nagaraja, N. S., Asstt. Professor.

It is proposed to study some aspects of auditory signal detection in the presence of noise, by human observers, from the point of view of statistical decision theory. Results from psychophysical experiments employing human observers will form the basic data for the analysis.

621.384133

Transistors

1639.80 Awatar Singh. Design and development of high frequency transistorised oscillators and amplifiers. Banaras, Electrical Engineering, 1966-67. Banerjee, S. S., Reader.

Single and three-phase transistorised oscillators are being designed and constructed for the study of their stability and variation of frequency with the variation of the parameters of the transistors.

621.384134

1640.81 Udit Narain Singh. Design and development for transistorised twin receivers for the study of the variation in the angle of arrival of down coming radio waves. Banaras, Electrical Engineering, 1966-68. Banerjee, S. S., Reader.

The twin transistorised receiver is being designed and constructed for the measurement of the angle of arrival of the down coming radio waves.

621.384134

Antennas

1641.82 Bhattacharya, Dilip. Sub-surface communication. I.I.T., Kharagpur, Electronics & Electrical Communication Engineering, 1966-69. Chatterjee, Biswanath, Asstt. Professor.

The object of the research is to establish an efficient communication system and to this effect, it is proposed to design and develop suitable antennas at the low frequency to be used for underground communication. A closed-wound helical antenna and a toroidal antenna are under study.

621.384135

1642.83 Garg, Virendra Kumar. Study of absorption of radio waves in the ionosphere. Banaras, Electrical Engineering, 1965-68. Banerjee, S. S., Reader.

Irregularities in the ionosphere are being studied with pulse transmitters and receivers. Horizontal rhombic and dipole transmitting aerials have been used for locating the seats of irregularities. The anomalous behaviour of the reflected echoes is being investigated to gain a knowledge of the dimensions of the irregularities.

621.384135

1643.84 Kak, Avinash C. Antenna pattern synthesis. I.I.T., Delhi, Electrical Engineering, 1966-69. Indiresan, P. V., Professor.

It is proposed to investigate the present methods of antenna pattern synthesis and electronic scanning by antennas.

621.384135

1644.85 Mahendra Singh. Radiation from curved aperture surfaces. I.I.T., Kharagpur, Electronics & Electrical Communication Engineering, 1965-67. Sanyal, G. S., Professor.

The radiation, and gain and impedance from an aperture antenna, having a curved aperture surface, are being investigated to find out the optimum curvature of the aperture.

621.384135

1645.86 Tatiraju, Satyanarayana Murty. Sub-surface communication. I.I.T., Kharagpur, Electronics & Electrical Communication Engineering, 1966-69. Chatterjee, Biswanath, Asstt. Professor.

The object of the research is to establish an efficient communication system suitable for sub-surface communication and to this effect, the work is being done to design and develop suitable antennas at the low frequency, to be used for underground communication. The electrical properties of the earth, like conductivity and dielectric constant, are under investigation as they play a major role in the propagation of a sub-surface wave.

621.384135

Communication Systems

1646.87 Baskaran, P. Efficient speech communication. I.I.T., Delhi., Electrical Engineering, 1966-69. Indiresan, P. V., Professor.

It has been found that intelligible communication is possible by transmitting only the pitch and formant frequencies contained in the speech signal, thereby reducing the bandwidth and increasing the efficiency of communication. The problem is to track the instantaneous pitch and formant frequencies contained in the speech signal. Automatic phase lock loops and other methods are being tried to solve the problem.

621.384152

1647.88 Jayant, N. S. Communication system design in the presence of impulsive atmospheric noise. I. I. S., Bangalore, Electrical Communication Engineering, 1965-68. Chandrashekhar Aiya, S. V., Professor and Head of the Department.

The coding and modulation schemes are being studied for reliable transmission of binary data in the presence of atmospheric noise bursts.

621.38415

Radiotelegraphy

1648.89 Uttaradhi, Gulshan Kumar. Coding in communication systems. I. I. T., Delhi, Electrical Engineering, 1966-69. Indiresan, P. V., Professor.

Certain coding techniques will be employed to develop a competent secrecy system. The proposed system will protect the radio transmission of teleprinter signals against jamming. The most important aspect of the system will be its wide bandwidth, because it is known that narrow band signals are inherently susceptible to jamming.

621.3842

Heat & Prime Movers

Heat Transfer

1649.90 Mukhopadhyay, Prabhat Chandra. Thermal diffusion problem. Calcutta, Engineering, 1965-67. Independently.

621.4022

1650.91 Rao, H. V. Heat transfer. I. I. T., Kharagpur, Mechanical Engineering, 1965-68. Mokadam, R. G., Professor.

The transient conditions in an electrically heated conducting wire are being studied. The study has applications in the rational design of delay fuses for electrical appliances.

621.4022

1651.92 Saluja, Som Nath. An investigation into the rates of heat transfer through buried coils using earth as a source of low grade heat for a heat pump. I.I.T., Delhi, Mechanical Engineering, 1964-68. Moore, N.P.W., Visiting Professor and Head of the Department.

The investigation pertains to the study and analysis of thermal properties of the soil, determination of its heat transfer characteristics, estimation of the rates of heat transfer through buried coils, and the study of the characteristics of heat pump when operating with earth as a source of heat.

621.4022

1652.93 Singheshwar Prasad. Heat transfer in melting solids. I.I.T., Kanpur, Mechanical Engineering, 1966-68. Agrawal, H. C., Asstt. Professor.

A theoretical analysis has been undertaken to study the problem of heat transfer in melting and molten solids. The analysis of heat losses from a molten solid is of great practical interest in foundry engineering. The theoretical results will be checked by experiments in the laboratory.

621.4022

Fuels & Combustion

1653.94 Sharma, Shiv Prasad. Experimental determination of burning velocity of premixed combustible mixtures by spherical bomb method. Roorkee, Mechanical Engineering, 1965-68. Gupta, C. P., Professor.

The combustible mixture of acetylene and air has been centrally ignited in a spherical bomb. Photographs of growing flame sphere and continuous pressure records have been obtained simultaneously. The burning velocities have also been determined by two independent methods. The effect of freon-12 additions on the burning velocity is being investigated for various mixture strengths.

621.4023

Internal-Combustion Engines

1654.95 Kamal Kumar. Investigation of intake process in 4 stroke I. C. engines. Jabalpur, Govt. Engg. College, Jabalpur, 1965-68. Gupta, Vishnu Dutta, Principal and Head of the Department of Mechanical Engineering, Govt. Engg. College, Jabalpur and Tyrichev, Albert G., Visiting Professor.

Calcultions have been made to show the effect of compression ratio, stroke bore ratio, pressure and temperature of residual gases, discharge coefficient, inlet pressure and optimum interval on volumetric efficiency. Experimental set has been prepared to study the effect of valve diameter, lift seat angle and position of the valve on coefficient of discharge.

621.43

1655.96 Kathuria, Mohan Lal. Investigation of compression and expansion processes in 4 stroke I. C. engines. Jabalpur, Govt. Engg. College, Jabalpur, 1965-68. Gupta, Vishnu Dutta, Principal and Head of the Department of Mechanical Engineering, Govt. Engg. College, Jabalpur and Tyrichev, Albert G., Visiting Professor.

The object of the study is to prepare a variable polytropic index for the compression and expansion strokes at different loadings. For this purpose, heat transmission in compression and expansion will be calculated and an exact heat balance sheet prepared. So far calculations have been made with the help of differential equations.

621.43

1656.97 Saxena, Lalit Mohan. Investigation of heat transmission in 4 stroke I. C. engine. Jabalpur, Govt. Engg. College, Jabalpur, 1965-68. Gupta, Vishnu Dutta, Principal and Head of the Department of Mechanical Engineering, Govt. Engg. College, Jabalpur and Tyrichev, Albert G., Visiting Professor.

621.43

Gas-Turbine Engines

1657.98 Sen, Syampada. Gas turbine. Calcutta, Engineering, 1961-67. Banerjee, Durgadas.

621.433

High-Compression-Ignition Engines

1658.99 Madhusudana, C.V. Theoretical and experimental studies on the performance of high speed, positive displacement superchargers for diesel engines of small power. I.I.S., Bangalore, Internal Combustion Engineering, 1965-70. Sreenath, A. V., Asstt. Professor.

621.4361

1659.100 Narasimhan, M. G. Studies relating to charge stratification in petrol engines. I.I.S., Bangalore, Internal Combustion Engineering, 1966-70. Narayanaswamy, K., Asstt. Professor.

Analytical and experimental studies on charge stratification are proposed to be carried out by fuel injection against swirling air. The fuel drop life, trajectory and the mixture strength contours inside the cylinder will also be evaluated. Experimental investigations, apart from the engine tests, will include a bomb test.

621.436

1660.101 Subramanyam, G. R. Theoretical and experimental studies on 'vapour phase combustion' in compression ignition engine. I.I.S., Bangalore, Internal Combustion Engineering, 1965-70. Narayanaswamy, K., Asstt. Professor.

Theoretical and experimental investigations are being done to determine the optimum evaporation and heat release rates of fuel films smeared on the walls of a combustion chamber, and to study the effect of combustion chamber geometry, swirl velocity and wall temperature.

621.436

1661.102 Sud, Y. C. Effect of operating parameter on ignition delay in diesel systems. I. I. T., Delhi, Mechanical Engineering, 1965-68. Moore, N. P. W., Visiting Professor and Head of the Department.

Ignition delay values in a working diesel engine will be measured under various conditions, such as, effect of CR, CN, fuel properties, injection advance, speed, injection pressure etc. The results will be analysed to develop a basic equation for ignition delay calculations in a working engine.

621.436

1662.103 Venkatesh, S. Studies on lubrication in I. C. engines. I.I.S., Bangalore, Internal Combustion Engineering, 1965-70. Sreenath, A. V., Asstt. Professor.

Investigations are being carried out to study the nature of the oil film between piston rings and the cylinder liner of a high speed diesel engine. It is proposed to measure the oil film thickness between the piston ring and cylinder liner using electrical capacitance technique. Analytical studies will also be done to predict the oil film thickness under various engine operating conditions and these predictions will be verified exprimentally.

621.4368

Nuclear Engineering

1663.104 Varadarajan, Bhartur Narasimhiengar. Mechanism of sputtering. I. I. T., Bombay, Electrical Engineering, 1965-68. Bhagavat, Gopal Krishnamurthy, Professor.

It is proposed to investigate the effect of sputtering produced by positive ionic impact on targets of insulators and semiconductors by using a P. I. G. source as well as a canal ray source, and also to find out how the rate of sputtering varies with the mass of the impacting ion.

Ind. Jour. Phys. 33 ; 1959 : p. 127.

621.48

Pneumatic & Low Temperature Technology

Vacuum Technology

1664.105 Krishnamurthy, P. R. Measurement of ultra-high vacuum.

I. I. T., Bombay, Electrical Engineering, 1963-67. Balakrishnan, C., Professor.

Field plottings for various geometries of hot cathode B. A. gauges have led to the feasibility of a new geometry. The gauges of various designs have been fabricated with techniques developed in the laboratory. A calibration system to respond in a range of 10^{-5} to 10^{-11} torr has been designed and is being built up in the laboratory. Theoretical investigations into the paths of electrons and ions in these geometries and their effects on sensitivity are also being carried out.

621.55

Refrigeration

1665.106 Bijlani, Chander Assandas. Use of mixtures of refrigerants in compression refrigeration. I. I. T., Bombay, Mechanical Engineering, 1964-67. Parulekar, Bhaskar Balkrishna, Professor.

Thermodynamic properties of binary mixtures of freon-12 and freon-22 have been calculated and their refrigeration and heat transfer characteristics are under study.

621.564

1666.107 Rajendra Prakash. Heat transfer and pressure drop in two-phase flow of refrigerants. Roorkee, Mechanical Engineering, 1964-67. Shankar Lal, Professor and Head of the Department.

621.564

Cryogenic Techniques

1667.108 Achuthan, Mooriath Variath. Heat transfer in film condensation. I. I. T., Bombay, Mechanical Engineering, 1965-68. Independently.

A theoretical analysis of the heat transfer during film condensation of a saturated vapour has been carried out. The phenomenon of interphase thermal resistance has been used to explain the discrepancy between the prediction by classical theory and experimental data.

621.59

1668.109 Joshi, M. Das. Studies on solidification of castings. I. I. T., Kharagpur, Mechanical Engineering, 1966-68. Independently.

It is proposed to investigate the solidification time of castings and ingots by analytical and numerical methods and compare the same with experimental results.

621.59

1669.110 Magal, Bhimasenarao Seshagirirao. Condensation of steam at low pressures. I. I. T, Bombay, Mechanical Engineering, 1965-67. Independently.

The investigation of interphase temperature drop between steam and condensate is being carried out under low pressures. The heat transfer coefficients during film condensation are also being investigated at low pressures between 10 mm. of Hg and 300 mm. of Hg, both in the absence of air and in the pressure of non-condensable gases. The steam will be superheated and its effect on condensation rate investigated. Correlation of the data will also be done to explain the findings and the departure from Nusselt's theory.

621.59

Mechanical Engineering

Factory Operations

1670.111 Das, S. C. Metal cutting. I. I. T., Kharagpur, Mechanical Engineering, 1961-67. Mishra, R, Senior Professor.

The investigation of influences of different parameters in drilling and microdrilling operations has been undertaken.

Jour. Sci. Engg. Res. 8 (1) ; 1964 : p.145-156.

621.75

Mechanical Power Transmission

Machine Design

1671.112 Lakshmi Venkateshwar Prasad. Design considerations for machine components subjected to high pressure cycling. I. I. T., Delhi, Mechanical Engineering, 1965-68. Moore, N. P. W., Visiting Professor and Head of the Department.

It is proposed to study the fatigue behaviour of high strength steel cylinders subjected to low cycle high pressure cycling. The results will help establish design criteria for semi-continuous hydrostatic extrusion containers or similar apparatus subjected to dynamic pressure loading.

621.815

1672.113 Ramesh Mohan. Stochastic models in design and use of machining equipment. I. I. T., Kharagpur, Mechanical Engineering, 1965-68. Belgaumkar, B. M., Professor and Head of the Department.

Theoretical and practical investigations related to location in equipment design, empirical feed back control in machining and selective assembly are in progress.

(1) Technometrics. 5 ; Aug '63 : p. 404-406 ; and (2) ibid. 6 ; Nov.' 64 : p. 423-438.

621.815

Transmission Elements

1673.114 De, Pulak. Investigation in the steady state and non-steady state analysis of fluid couplings. I. I. T., Kharagpur, Mechanical Engineering, 1965-68. Belgaumkar, B. M., Professor and Head of the Department.

A comprehensive literature survey reveals the present state of the science of design and analysis of the behaviour of fluid couplings and other hydrodynamic drives as a highly empirical one. A steady state analysis has been developed from the basic hydrodynamics of the flow. An attempt is being made to obtain a satisfactory non-steady state analysis and rationalise the design principles of fluid couplings.

621.825

1674.115 Ghosh, B. G. Studies on performances of hydrostatic journal bearings. I. I. T., Kharagpur, Mechanical Engineering, 1964-67. Belgaumkar, B. M., Professor and Head of the Department.

The performances of compensated, externally pressurized journal bearings have been studied and an approximate theoretical solution is being attempted. Experimental set up has been fabricated to investigate the validity of the solution.

621.821

1675.116 Padmanabhan, Subramaniam. Friction in sintered bearings of small diameters. I. I. T., Madras, Mechanical Engineering, 1965-67. Narayanamurthi, R. G., Professor and Head of the Department.

The frictional behaviour of sintered metal bearings for shafts of less than 5 mm diameter is being investigated. It is proposed to establish a correlation between the theory and actual performance. A simplified theory will be put forward.

621.822

1676.117 Sharma, Jagdish Prasad. Investigation of lubrication and wear properties of a thrust bearing under extreme pressure and temperature conditions. I. I. T., Delhi, Mechanical Engineering, 1965-69. Moore, N. P. W., Visiting Professor and Head of the Department.

The thrust bearing is of special type having no balls/rollers and can work with both air and liquid lubricants. Its performance will be studied both under ambient and in extreme pressure and temperature conditions. This bearing will have practically less wear as compared to roller ball thrust bearing.

621.822

1677.118 Veluswami, Mettupalayam Appavoogounder. Deterioration of contact surfaces. I. I. T., Madras, Mechanical Engineering, 1966-68. Venkatesh, V. C., Asstt. Professor.

The superficial deterioration of contact surfaces in gears may be due to pitting, abrasion, scoring, spalling, galling and seizing. The investigation of the physical process of the surface failure has been studied with special reference to the phenomenon of pitting. Its origin, effect of lubrication, material, load conditions etc., are being studied.

621.833

Lubrication & Lubricants

1678.119 Banerjee, A. K. Some studies related to the stick-slip sliding of solids. I. I. T., Kharagpur, Mechanical Engineering, 1964-67. Chandiramani, K. G., Professor and Sinha, G. L., Asstt. Professor.

Theoretical studies have been made to show that (1) the critical velocity of stick-slip depends quantitatively on the nature of the kinetic friction curve as much as on static friction, (2) the self-excited nature of stick-slip should give frequency entrainment under a vibratory force in the direction of motion, and (3) the action of a transverse force may be to reduce critical velocity due to a squeeze action on the lubricant.

621.89

Tools

Cutting & Sawing Machinery

1679.120 Ghosh, Amitabha. Mechanism of cutting tool wear. Calcutta, Engineering, 1964-67. Bhattacharyya, Amitabha, Professor of Mechanical Engineering, Jadavpur University.

621.93

1680.121 Radhakrishnan, V. Wear of cutting tools. I. I. T., Madras, Mechanical Engineering, 1966-68. Venkatesh, V. C., Asstt. Professor.

It is proposed to study the surface transformation of cutting tools at high speeds and the phase transformation by electron diffraction. Application of hydraulic analogy for determining boundary layer conditions is also envisaged.

621.93

Mining Engineering

1681.122 Bose, Harendra Kumar. Investigation into the study of lighting. Calcutta, B. E. College, Howrah, 1963-67. Ray, P. K., Lecturer in Mining Engineering, B. E. College, Howrah.

622.47

1682.123 Chakrabarti, Jadablal. Investigation of the behaviour of coalmeasures rocks. Calcutta, B. E. College, Howrah, 1962-67. Ray, P. K., Lecturer in Mining Engineering, B. E. College, Howrah.

622.331

1683.124 Dhar, Rattan Lal. Techniques of interpretation in mining geophysics. Banaras, Geophysics, 1966-68. Rathor, H. S., Head of the Department.

Some concrete cases of the Indian region have been taken up for seismic and electromagnetic interpretations. Model studies are also planned.

622.15

Naval Engineering

1684.125 Ghose, J. P. Resistance of ships. I.I.T., Kharagpur, Naval Architecture & Marine Engineering, 1962-68. Raghuram, T.S., Design Manager, M/s. Mazagon Docks Ltd., Bombay.

The resistance of a ship model is being studied in both the smooth and fully rough conditions. Special emphasis is, however, being laid on the resistance of a fully rough model to understand its resistance behaviour.

623.848

1685.126 Gokarn, Ramchandra Prabhakar. Resistance of ships. I.I.T., Kharagpur, Naval Architecture & Marine Engineering, 1962-68. Raghuram, T. S., Design Manager, M/s. Mazagon Docks Ltd., Bombay.

Large scale models with artificially stimulated turbulence give rise to various difficulties when used for the estimation of resistance of ships. The feasibility of using very small models in laminar flow is, therefore, being explored.

623.848

1686.127 Kundu, Jati Priya. Strength of ships. I.I.T., Kharagpur, Naval Architecture & Marine Engineering, 1961-70. Raghuram, T.S., Design Manager, M/s. Mazagon Docks Ltd., Bombay.

The stresses set up in the ship's hull are being investigated in actual working conditions to obtain optimum hull structure.

623.84

1687.128 Pal, Prabhat Kumar. Stability in all conditions. I.I.T., Kharagpur, Naval Architecture & Marine Engineering, 1961-70. Mitra, S. C., Professor and Head of the Department.

Conditions, that a freighter with any position of heel and trim will not sink, are being formulated.

623.8245

Civil Engineering

1688.129 Oswal, Hira Lal. A critical evaluation of exterior orientation problems of photograms and stereograms. Roorkee, Civil Engineering, 1966-68. S. R. Singh, Assoc. Professor.

It is proposed to study the effects in mapping of residual errors of relative orientation. Different methods will be compared critically and their theoretical suitability judged on their fastness and theoretical and actual errors. The problems of improving relative orientation will also be investigated and the effect of correlation in observations assessed.

624.0222

Structural Engineering

Foundation Engineering

1689.130 Bandyopadhyay, Kalidas. Trasses in some types of foundation structures. Calcutta, B. E. College, Howrah, 1965-67. Mukherjee, S. K., Lecturer, B. E. College, Howrah.

624.15335

1690.131 Basu, Pradyot Kumar. Trasses on stalls. Calcutta, B. E. College, Howrah, 1965-67. Mukherjee, S. K., Lecturer, B. E. College, Howrah.

624.15335

1691.132 Bhawani Singh. Study of shear strength of partially saturated soils. Roorkee, Civil Engineering, 1965-68. Jagdish Narain, Professor.

The soil in the earth dam is partially saturated. The stresses and strains are being computed in earth dam by polynomial method. The iron linear nature of stress-strain curve will also be considered.

624.1513

1692.133 Gopal Ranjan. Elastic behaviour of soils under static and dynamic loads. Roorkee, Civil Engineering, 1965-70. Jagdish Narain, Professor and Shamsher Prakash, Reader.

In soil mechanics, the theory of elasticity is used for the solution of various problems of stress distribution and soil deformation. The variation of elastic modulus and poisson's ratio with different factors in sands and clays will be studied under static and dynamic loads.

624.151

1693.134 Gulhati, Shashi K. Shear strength of compacted soils in the partially saturated and saturated states. I.I.T., Delhi, Civil Engineering, 1964-68. Henkel, D. J., Professor.

The shear strength behaviour of compacted soils is being studied by a comprehensive triaxial testing programme. Equipment has been developed for the measurement of negative pore water pressures. The research is so oriented that it will have significance in the specific context of compacted earth embarkments.

624.1513

1694.135 Kulkarni, R. P. Creep strength of saturated clays. I.I.T., Delhi, Civil Engineering, 1966-69. Saranjit Singh, Professor.

The shear strength of saturated clays under creep condition is being investigated. The influence of following factors on the creep stregnth of saturated soil will be studied : (a) clay mineral, (b) structure, (c) stress history, (d) type of pore fluid, and (e) salt concentration in pore fluid.

624.1513

1695.136 Ninan, P. K. Shell foundations. I.I.T., Madras, Civil Engineering, 1966-68. Varghese, P. C., Professor and Head of the Department.

The ultimate strength of hyperbolic paraboloidical individual and combined shell footings for columns is being studied by conducting tests on cement plaster models in sand. These are expected to yield a balanced design of these footings with respect to the strength of the soil.

624.1513

1696.137 Pise, Prabhakar Jagannathrao. Stability of pile groups with batter piles subjected to lateral loads. I.I.T., Kharagpur, Civil Engineering, 1966-69. Srinivasa Murthy, Vittalpur Nanjundiah, Asstt. Professor.

Batter piles of 20° batter are being tested along with batter of 0° to develop a suitable relation of the group for the lateral load conditions, i.e. rotation of pile group, maximum stress, reaction etc. The experiments will be carried on model scale in non-cohesive dry sand. The model piles are aluminium alloy hollow tubes and the pile caps of the same materials.

624.154

1697.138 Raghavendrachar, Andankovil Narasimhachar. A study of the deformation characteristics of clays. I.I.T., Kharagpur, Civil Engineering, 1965-68. Sen, Bidhu Ranjan, Professor.

The one-dimensional theory of consolidation as developed by Dr. K. Teryaghi does not take into account a number of factors, like secondary consolidation, pressure-increment ratio, scale factors etc. Results of a number of tests on remoulded and undisturbed soil samples are being analysed to propose a suitable method for predicting the deformation characteristics of clays taking all the above factors into account.

624.1513

1698.139 Ramanatha Ayyar, T. S. Strength characteristics of Kuttanad clay. Roorkee, Civil Engineering, 1964-66. Jagdish Narain, Professor.

Kuttanad clay from Kerala shows different structures under different treatments. Soil structure has been measured in terms of dry density at shrinkage limit, petrographic examination and X-ray diffraction patterns, and the variation of shear parameters explained with reference to structure.

624.1513

1699.140 Rao, V. V. S. Shear strength of soils under dynamic loads. I.I.T., Delhi, Civil Engineering, 1963-68. Saranjit Singh, Professor.

The effects of dynamic loads on the shear strength of sands are under investigation. On the basis of a granular model, a new theory correlating the shear strength with the dynamic load and void ratio has been developed. A modified direct shear apparatus has also been developed for dynamic testing of soils. Measured shear strength has shown good agreement with the values based on theoretical relationship.

624.1513

1700.141 Sahgal, Prem Prakash. Mechanism of ripple formation on granular bed. Roorkee, Civil Engineering, 1964-67. Bharat Singh, Junior Professor.

It is proposed to investigate the circumstances in which the bed ripples with the flow of liquid that accompanies the movement of the bed. An attempt is being made, by changing the viscosity of the liquid, to formulate conditions under which no rippling will take place.

624.156

1701.142 Swami Saran. Bearing capacity of footings subjected to moments. Roorkee, Civil Engineering, 1966-68. Shamsher Prakash, Reader.

Model tests have been carried out to determine the bearing capacity. Analytical expressions will be developed for contact pressure distribution. A criteria of design of footing will also be evolved.

624.1513

1702.143 Venkatanarayana, Peddibotla. Strength characteristics of soils. I. I. T., Kharagpur, Civil Engineering, 1965-67. Sen, Bidhu Ranjan, Professor.

Stress controlled cone penetration tests are planned. A stress controlled automatic stress-strain recorder has been designed and fabricated. Different sizes of cones, with varying angles, and different sizes of moulds have also been made. The testing on soil samples of different places is in progress. It is felt that the bearing capacity can be deduced from the experimental results and the same will be correlated analytically.

624.1513

Structural Theory

1703.144 Ajamani, Jagdish Lal. Elasto-plastic behaviour of steel frames. Roorkee, Civil Engineering, 1965-68. Jain, Om Prakash, Professor and Head of the Department and Arya, Anand Swarup, Professor of Earthquake Engineering.

Lateral-torsional buckling of beam-columns in the elasto-plastic range is being studied and it is proposed to compute the effect of this lateral-torsional buckling of beam-columns on the overall strength of steel portal frames.

624.1773

1704.145 Brijesh Chandra. Study of dynamic behaviour of elasto-plastic frames. Roorkee, Civil Engineering, 1964-68. Jai Krishna, Professor and Head of the Department of Earthquake Engineering and Chandrasekaran, A. R., Reader in Earthquake Engineering.

It is proposed to investigate the dynamic behaviour of multi-storeyed framed structures experiments on steel models which will yield useful results regarding the actual load-deflection relationships, so far assumed to be elasto-plastic.

624.1773

1705.146 Buragohain, Dhirendra Nath. Longitudinally continuous short span folded plates. I. I. T., Bombay, Civil Engineering, 1965-67. Ramesh, Coorg Krishna Iyenger, Professor.

The analysis has been attempted with plate theory and plane elasticity theory using biharmonic eigen functions and idealized diaphragm conditions. A variational approach is also attempted using numerical technique. The finite element analysis has been used without idealizing the support conditions. Tests on aluminium models and photoelastic investigations are expected to provide experimental data.

624.1772

17C6.147 Chakrabarti, Subrata. Application of finite element method to the analysis of thin shells. Roorkee, Civil Engineering, 1965-67. Jain, Om Parkash, Professor and Head of the Department and Ramaswamy, G. S., Director, Structural Engineering Research Centre, Roorkee.

Shells having arbitrary geometry and loading conditions cannot be adopted in practice because of their complex nature of analysis. It is proposed to study the behaviour of certain shells of this type.

624.1776

1707.148 Devarajan, Jagadeeswaran. Thermoelasticity. I. I. S., Bangalore, Civil & Hydraulic Engineering, 1966-68. Sundara Raja Iyengar, K. T., Professor.

It is proposed to study the transient thermal stresses in cylinders.

624.176

1708.149 Hariharan Iyer, Sankaran. Analysis of continuous cylindrical shells. I. I. T., Bombay, Civil Engineering, 1964-68. Ramesh, Coorg Krishna Iyenger, Professor.

The accuracy and the feasibility of the existing methods of analysis for continuous cylindrical shells with various boundary conditions are being critically studied both theoretically and experimentally. The applicability of some of the latest techniques, such as, 'Finite Difference' and 'Finite Element' is being examined for this problem.

624.1776

1709.150 Jagadish, Kaup Srinivasa Rao. Dynamic response of plate structures under moving loads. I. I. S., Bangalore, Civil & Hydraulic Engineering, 1963-67. Sundara Raja Iyengar, K. T., Professor.

The problem consists of frequency analysis and dynamic response of plates and plate beam structures used in bridges. The response problem has been studied under the influence of moving vehicles. The object of the study is to determine the dynamic stresses in the bridge structure.

624.1772

1710.151 Kameswara Rao, N. S. V. Vibration of plates on semi-infinite elastic solids. I. I. T., Kanpur, Civil Engineering, 1966-68. Anandakrishnan, M., Professor and Head of the Department.

The vibration of rectangular plates subjected to periodic loading resting on a semi-infinite elastic body has been analysed. The displacements in the medium are being studied. The natural frequency of the system is also being predicted.

624.1772

1711.152 Narayana Iyengar, Rangachar. Dynamic response of structures under earthquake forces. I. I. S., Bangalore, Civil & Hydraulic Engineering, 1966-69. Sundara Raja Iyengar, K. T., Professor.

The study consists in analysing the existing earthquake records and simulating them on computers to study the response of structures and evaluate the same with the help of statistical concepts.

624.176

1712.153 Paramasevan, P. Analysis of continuous plates on interconnected grids supported on columns, with or without openings. I. I. T., Kanpur, Civil Engineering, 1966-68. Sridhar Rao, J. K., Asstt. Professor.

Analysis using discrete element methods and a digital computer is in progress. Development of rational design methods is envisaged.

624.1772

1713.154 Prabhakara, M. K. Study of some three-dimensional elasticity problems and their applications. I. I. S., Bangalore, Civil & Hydraulic Engineering, 1964-68. Sundara Raja Iyengar, K. T., Professor.

Three-dimensional elasticity problem of the stress distribution in finite rectangular prisms has been studied with the help of Galerkin vector strain function and multiple fourier series method. Stresses have been evaluated along the axis of the prism as well as at the surface in order to compare the validity of the existing theoretical and experimental results. The results obtained by the elasticity solution will be used to study some problems of practical interest, in particular the end-block analysis of post-tensioned concrete beams.

624.176

1714.155 Raghupathi, M. A three-dimensional investigation into the anchorage zone of post-tensioned prestressed structural units. I. I. T., Delhi, Civil Engineering, 1966-69. Rasheeduzaffar, Asstt. Professor.

Since the three-dimensional effect has considerable influence over the behaviour of the high bursting stresses caused in the end-blocks under prestressing, it is planned to investigate the problem in three phases: (1) Three-dimensional photoelastic experiments, (2) Experiments on prototype models, and (3) Study of the failure characteristics by photostress.

624.171

1715.156 Ramaiah, M. Elastic stability of shell structures. Roorkee, Civil Engineering, 1966-68. Jain, Om Prakash, Professor and Head of the Department and Ramaswamy, G. S., Director, Structural Engineering Research Centre, Roorkee.

With the present trend towards long spans and complex shapes, the problem of elastic stability of shell structures has assumed great importance. But unfortunately very little information is available on this subject. The present investigation aims at a better understanding of the buckling behaviour of concrete shells.

624.1776

1716.157 Ramakrishnan, C. V. Waves in thick walled spherical shell. I. I. T., Kanpur, Civil Engineering, 1966-68. Shah, Arvind H., Asstt. Professor.

Using three-dimensional elasto-kinetic equations, waves in solid, hollow and composite spheres are being investigated. For simplicity all shell theories are also being investigated and compared.

624.1776

1717.158 Seetharamulu, Kaveti. Inelastic analysis of beams on Winkler's bed and application to reinforced concrete beams. I. I. T., Bombay, Civil Engineering, 1962-66. Mhatre, Ramkrishna P., Senior Professor.

An inelastic analysis of beams on Winkler's bed has been suggested and its accuracy discussed. The proposed method requires a simple solution of a transcendental equation and avoids incremental load analysis or/and iteration required for other methods of analysis. The test beams consist of flexure beams and main beams on Winkler's bed.

624.171

1718.159 Srinivasan, Rajapalayam Shanmugam. Structural mechanics. I. I. S., Bangalore, Civil & Hydraulic Engineering, 1964-68. Sundara Raja Iyengar, K. T., Professor.

The work consists of theoretical analysis of bending of semi-infinite rectangular strips and skew plates for different kinds of boundary conditions and loads. It is proposed to verify the analytical results experimentally.

624.171

Structural Design

1719.160 Agrawal, Krishna Kumar. Optimum design criterion of two-way R. C. slabs taking into account the membrane actions. I. I. T., Kharagpur, Civil Engineering, 1965-68. Ray, Durga Pada, Asstt. Professor.

624.183

1720.161 Alexander, Subbiah. Ultimate strength of reinforced concrete columns subject to eccentric loading. Madras, P. S. G. Charities College of Technology, Peelamedu, 1963-67. Ramakrishnan, V., Professor and Head of the Department of Civil Engineering, P. S. G. Charities College of Technology, Peelamedu.

The research work comprises experimental and analytical study of the behaviour and strength of eccentrically loaded reinforced concrete columns by varying the quality of concrete and the proportion of reinforcement. Analysis has been improved by adopting a single equation for the complete stress-strain curve of concrete and introducing rigorous theory.

624.183

1721.162 Barve, R. S. Esto-plastics: Behaviour of plastic material. Bombay, Chemical Technology, 1963-67. Joshi, M. V., Professor.

The aim of the research is to obtain the characteristic curve explaining the 'non-elastic' behaviour of plastics to develop a basis for the design of plastic components for structural use. The effect of creep in the stress-strain relation of plastics has, therefore, been estimated as a first step, by studring both reinforced and unreinforced plastic specimens subjected to different stress conditions under constant temperature.

624.189

1722.163 Ganesan, Thirumanampet Ponnusamy. Strength and behaviour of R. C. vierendeel girders. I.I.T., Madras, Civil Engineering, 1966-68. Varghese, P. C., Professor and Head of the Department.

The experimental investigation of the behaviour and ultimate strength of R. C. vierendeel girders is proposed.

The effect of various parameters, like depth span ratio, ratio of slenderness of members etc., will be studied in detail. The mechanism of redistribution of moments will also be studied.

624.183

1723.164 Maity, Subhas Chandra. Ultimate load carrying capacity of steel joints of variable sections, encased in concrete. I.I.T., Kharagpur, Civil Engineering, 1966-69. Narasimhan, Rajendram Krishnamachari, Asstt Professor.

An investigation is being done on encased beams with different load positions to study the formation of plastic hinges and the redistribution of moments.

624.182

1724.165 Mukhopadyay, Madhujit. Ultimate strength of R. C. beam under combined action of shear force, bending moment and axial force. I.I.T., Kharagpur, Civil Engineering, 1966-68. Sen, Bidhu Ranjan, Professor.

Casting of beams is in progress. These will later be tested to study the effect of different variables pertaining to the ultimate strength under combined effect of shear force, bending moment and axial force.

624.183

1725.166 Nagi Reddy, K. Studies on reinforced concrete with spiral binding. I.I.S., Bangalore, Civil & Hydraulic Engineering, 1966-68. Sundara Raja Iyengar, K. T., Professor and Desayi, Prakash, Lecturer.

It is proposed to study the effectiveness of helical binding in the compression zone of concrete beams and to get the stress-strain diagrams for helically bound concrete. This stress block will be utilized to develop an expression for ultimate load of beams and to study the redistribution of ultimate moments in indeterminate structures.

624.183

1726.167 Narayanaswamy, Vadakkencheri Parameswaraiyer. Ultimate load analysis of reinforced concrete continuous beams. I.I.S., Bangalore, Civil & Hydraulic Engineering, 1964-68. Sundara Raja Iyengar, K. T., Professor.

The flexural behaviour of reinforced concrete sections has been studied on the basis of stress-strain relationship of concrete and steel. A method for the analysis of reinforced concrete continuous beams has also been developed and the results of the analysis will be compared with those obtained from the tests.

624.183

1727.168 Nayar, K. K. A study on the behaviour of concrete structures at ultimate load. I.I.T., Delhi, Civil Engineering, 1966-69. Ahuja, B. M., Professor.

It is proposed to study the behaviour of flat slabs on interior support with special reference to the influence of punching shear on the ultimate load carrying capacity of the flat slab floor.

624.183

1728.169 Niyogi, Sanat Kumar. An investigation on the ultimate bearing strength of concrete under loading on limited area. I.I.T., Kharagpur, Civil Engineering, 1962-67. Independently.

1268 plain concrete specimens and 154 R. C. specimens covering all possible variables subjected to localised forces have been tested. Equations for two-dimensional and three-dimensional cases of loading and eccentric loading have also been derived.

624.183

1729.170 Raghavendra, Narasimhamurthy. Ultimate strength of prestressed concrete structures. I.I.S., Bangalore, Civil & Hydraulic Engineering, 1966-70. Sundara Raja Iyengar, K. T., Professor.

The study consists of the investigation of strength and behaviour of prestressed concrete beams under combined bending, shear and torsion.

624.183

1730.171 Ramamoorthy, Radhakrishnan. Response of reinforced concrete beams to cyclic loading. I.I.T., Madras, Civil Engineering, 1965-68. Varghese, P. C., Professor and Head of the Department.

It is proposed to study the response of reinforced concrete beams to variable cyclic loading. By varying the percentage of main reinforcement and shear reinforcement, a conclusion will be arrived at regarding the optimum percentage of reinforcement which will make the beam strong enough to resist the ordinary vibration encountered in practice.

624.183

1731.172 Satyanarayana Murty, Madugula Kumara. Investigation of the strength and stiffness of simple and two-span continuous rectangular reinforced concrete beams. I.I.T., Kharagpur, Civil Engineering, 1964-67. Sen, Bidhu Ranjan, Professor.

Expressions for the shear strength of beams, with and without web reinforcement, for different values of M/vd have been developed. The bending strengths of beams have been computed on the basis of the idealised stress-strain curve of concrete. Tests have also been done on 46 two-span continuous beams.

624.183

1732.173 Trikha, D. N. Ultimate strength of multi-storey reinforced concrete buildings. Roorkee, Civil Engineering, 1965-68. Jain, Om Prakash, Professor and Head of the Department.

The research comprises studies in flexural mechanics of reinforced concrete members, beam-column connection studies, and development of an office design procedure for ultimate strength of multi-storey buildings.

624.183

1733.174 Verreyya, Vastala. Strength studies of R. C. slabs with and without openings. I.I.T., Kharagpur, Civil Engineering, 1965-67. Narasimhan, Rajendram Krishnamachari, Asstt. Professor.

The tests on the R. C. slabs are in progress. The sizes of the slabs so far tested are 3′-0″ and 4′-0″ squares. All these slabs are simply supported and transverse loads of 4, 8 and 16 points have been applied. The aspect rates of the square openings provided vary from $\frac{1}{12}$ to $\frac{1}{2}$. Strain and deflection measurements have been taken for analysis.

624.183

1734.175 Vijaya Rangan, B. Investigations on R. C. and P. C. beams under combined loadings. I.I.S., Bangalore, Civil & Hydraulic Engineering, 1963-67. Sundara Raja Iyengar, K. T., Professor.

On the basis of certain mechanisms of failure and a failure criterion for concrete under combined stresses, a general theory has been developed for the strength of R. C. and P. C. beams under combined loadings. The theory is in good agreement with the test results of over two thousand beams. On the basis of the theory, certain design recommendations have also been suggested.

624.183

1735.176 Viswanatha, Chamarajanagar Subrahmanyaiah. Studies on strength and behaviour of reinforced concrete flexural members. I.I.S., Bangalore, Civil & Hydraulic Engineering, 1964-67. Sundara Raja Iyengar, K. T., Professor.

The investigation consists of detailed studies on short time and long time deflections and strength of reinforced concrete flexural members.

624.183

Bridges

1736.177 Nayak, G. C. Investigation on the load distribution on arches in bridges. Roorkee, Civil Engineering, 1964-68. Jain, Om Prakash, Professor and Head of the Department.

The possible load distribution analysis on arches has been divided into three approaches—a discrete system, continuous slab system and anisotropic shell system. Applications of finite elements method are being considered for the shell system and suitability of the methods of analysis will be verified by experiments.

624.6

Roads & Highways

1737 178 Khanna, Sudarshan Kumar. Effect of viscosity control of bituminous binders on physical properties of bituminous paving mixtures. Roorkee, Civil Engineering, 1964-67. Vaswani, Naraindas Kalachand, Junior Professor.

The experimental investigation on the analysis of viscous properties of bituminous binders and their effect on the stability of the resulting mixtures has been completed. A study of the effects on the flexural strength with varying rates of loading is in progress. A model testing on asphaltic concrete surface course for pressure transmission is also intended.

625.735

1738.179 Shah, Vipinchandra Chimanlal. Study of viscosity-temperature relationship of paving asphalts. Baroda, Civil Engineering, 1964-67. Rader, L. F. and Madan, P. J.

An attempt is being made to grade paving asphalts by fundamental viscosity than by penetration at 77°F. The viscosity at different temperatures is different for the same penetration but different chemical composition. It is proposed to find out the repeatability of different viscometers used at different temperatures, since one single equipment cannot be used at all test temperatures. Different precision formats have been used to compare repeatability. The study is being used to correlate viscosity, temperature and penetration.

625.85

1739.180 Somayajulu, Yedavally Purushothama. Use of low grade aggregates in highway construction with particular reference to degradation of aggregates in base courses. I.I.T., Kharagpur, Civil Engineering, 1963-67. Sen, Bidhu Ranjan, Professor.

The aim of the investigation is to study the possibility of using low grade aggregates in highway base construction. The phenomenon of degradation of aggregates is being studied with special reference to low grade types. It is proposed to develop a laboratory test to predict the degradation characteristics for any aggregate so that its usefulness can be judged from the point of view of degradation. A study will also be conducted on the treatment for stopping the degradation.

625.735

Hydraulic Engineering

Inland Waterways

1740.181 Abdul Khader, Mohamed Hussain. Application of potential flow techniques to hydraulic problems. I.I.T., Madras, Civil Engineering, 1966-68. Rouve, Gerhard, Visiting Professor.

Brink depth and surface profiles are being determined using numerical methods for steady, irrotational, free surface flow at a free overfall.

627.1251

1741.182 Bhagavantam, Dasika. Development of fluid birefringence technique for the study of some problems of viscous flow. I.I.T., Kharagpur, Civil Engineering, 1963-66. Visweswara Rao, Josyula, Professor and Head of the Department.

An attempt is being made to show the utility of the fluid birefringence technique for fluid flow problems of basic as well as applied nature. The governing equation has been derived and a method suggested to solve the same numerically. The use of the technique for quantitative analysis is, however, limited to the two dimensional flows only.

627.1258

1742.183 Das, Nabendu. Studies on river pollution in Bihar State. Calcutta, B. E. College, Howrah, 1962-67. Bhaskarani, T. B., Lecturer in Civil Engineering, B. E. College, Howrah.

627.122

Applied Hydrodynamics

1743.184 Majumdar, Somendra Kumar. Open channel transitions. I. I. T., Kharagpur, Civil Engineering, 1966-68. Visweswara Rao, Josyula, Professor and Head of the Department.

In subcritical flow, design of open channel transition is mostly empirical. An attempt is being made to formulate some design principles keeping in view the following facts : (i) Length of transition should be as short as possible ; (ii) Loss of head or afflux should be minimum ; and (iii) Velocity distribution at exit should be as in normal open channel flow.

627.1254

1744.185 Nalluswami, M. Nonlinear analysis of hydrologic systems. Madras, College of Engineering, Guindy, 1966-69. Kulandaiswamy, V. C., Professor of Hydraulic Engineering, College of Engineering, Guindy.

The research deals with the study of run off from catchments. Most of the existing procedures involve an assumption of linear relationship between rainfall excess and surface run off. The present study aims at developing a nonlinear model for the process.

627.125

1745.186 Narayanan, M. Studies on cavitation. Madras, College of Engineering, Guindy, 1966-69. Kulandaiswamy, V. C., Professor of Hydraulic Engineering, College of Engineering, Guindy.

Despite the advancements made in the construction of high-head structures, serious damage occurs due to cavitation, which has the effect of deteriorating flow efficiency, setting in vibrations and eroding guiding surfaces. A study of the cavitation inception and development in the different elements of hydraulic structures through experiments, review of the present day knowledge as well as theoretical analysis is contemplated.

627.12595

1746.187 Pande, Pramod Kumar. Study of liquid turbulence spectra behind grids using electromagnetic induction techniques. Roorkee, Civil Engineering, 1962-66. Garde, R. J., Reader.

Turbulence spectra as well as decay of turbulence behind various grids have been studied in a pipe with water flowing through it. The measurements have been made making use of the technique of electromagnetic induction, wherein the voltage induced by the movement of water in a magnetic field is measured and analysed. Studies have been made for single grids as well as a combination of grids.

627.12517

1747.188 Sambasiva Sastry, Cheruvu. Study of flow resistance by fluid birefringence technique. I. I. T., Kharagpur, Civil Engineering, 1962-67. Visweswara Rao, Josyula, Professor and Head of the Department.

A new useful apparatus, fluid polariscope, has been set up for the study of fluid flow problems. A solution of N.G.S. powder, a chemical dye, has been used to study the two-dimensional flow problems by the optical phenomenon of streaming birefringence in a way somewhat similar to the stress optical phenomenon in photoelasticity. The problem of fluid resistance in two dimensions with reference to the seepage loss between narrow openings of sheet pile cutoffs underneath permeable foundations is being studied.

627.1251

1748.189 Sarma, Seemanapalli Venkata Kameswara. Studies on partially saturated flow through porous media. I.I.T., Kharagpur, Civil Engineering, 1965-68. Visweswara Rao, Josyula, Professor and Head of the Department.

Analytical and experimental studies on the problems of one-dimensional and two-dimensional flow through porous media in the partially saturated condition are in progress. Practical applications to unsteady state flow as in the case of artificial recharge of ground water, and steady state flow as capillary seepage flow in earth dams are being considered.

627.1251

1749.190 Satish Chandra. Study of three-dimensional seepage below canal floors laid on porous foundations. Roorkee, Civil Engineering, 1964-68. Chaturvedi, R. S., Professor.

When the floors have smaller dimensions, the seepage below the floor is three-dimensional. The analysis for the uplift pressures below weir floors as analysed by Khosla are applicable for two-dimensional seepage only. The object of the present research is to find out the pressure below the floors taking into account the position of the water table.

627.13

1750.191 Sen, Rabindranath. Settling properties of flocculant materials. I. I. T., Kharagpur, Civil Engineering, 1963-68. Bhattacharyya, Biswanath, Asstt. Professor.

The study aims at finding out the relationship between various variables for quescent settling and continuous flow settling. It also aims at standardisation of a laboratory set up for continuous flow settling so that better parameters may be obtained for better design of settling tanks dealing with flocculant particles.

627.1251

1751.192 Sharma, Surendra Kumar. Stability of slopes subjected to efflux of seepage. I.I.T., Kharagpur, Civil Engineering, 1965-67. Visweswara Rao, Josyula, Professor and Head of the Department.

A generalised theory of exit gradients as affecting the stability of hydraulic structures has been formulated taking into account the effect of specific weight, buoyancy, friction and cohesion. Experimental verification of the theory has been made. The effect of post-Darcian flow near the exit, if any, on the exit gradient is being investigated.

627.1251

Reclamation

1752.193 Joshi, Sharadchandra Gajananrao. Field of groundwater control with reference to the arid zone problem. I.I.T., Bombay, Civil Engineering, 1964-68. Panikar, J. T., Professor and Head of the Department.

Groundwater is one of the major sources of water, especially in arid regions. The mechanics of rise of a water table, its control, storage computations etc., are important engineering design considerations. Investigations regarding these parameters are in progress.

627.56

1753.194 Singhal, Rameshwar Prasad. Study of a self formed channel on a model sand bed with special reference to perimeter adjustment. Roorkee, Civil Engineering, 1965-67. Bharat Singh, Junior Professor.

It is proposed to study the formation of a channel on a sand tray in the hydraulics laboratory. Varying discharges shall be run through an initially tight section on the 80′x12′ tray. The discharge shall carve its own section through sand. The water flowing through the channel shall be recirculated by a pump. 12 to 36 hour runs shall be made in which conditions with regard to sediment load, slope, channel dimensions etc., shall stabilize. The study shall help the design of irrigation channels.

627.52

Dams & Reservoirs

1754.195 Shah, Chandrakant Ratialal. Some aspects of density currents in reservoirs. Roorkee, Civil Engineering, 1965-68. Bharat Singh, Junior Professor.

Density currents in reservoirs are being studied with special reference to the phenomenon of plunging, interfacial stability, and efficiency of vertical withdrawal.

627.86

1755.196 Sharma, Yogendra Kumar. Study of earth dam on pervious foundation with positive cutoff and filter. Jabalpur, Govt. Engg. College, Jabalpur, 1964-67. Lakshmanswami, A., Principal (Retd.), Govt. Engg. College, Jabalpur and Patel, V. J., Professor and Head of the Department of Civil Engineering, Govt. Engg. College, Jabalpur.

Earth dams on pervious foundations are now indispensable. Theoretical and experimental works are intended to solve the problem. It is expected to develop a new method of scale transformation ; find the best location of positive cutoff and filter ; prepare design charts ; and deduce some conclusions of fundamental nature in the field of earth dam design.

Jour. Ind. Nat. Soc. Soil Mech. 5(1) ; Jan. '66.

627.83

Sanitary & Municipal Engineering

Municipal Water Supply

1756.197 Bhakuni, T. S. Studies on absorption of fluoride from drinking water by different ion-exchange materials developed indigenously. Nagpur, Central Public Health Engineering Research Institute, Nagpur, 1965-67. Sastry, C. A., Scientist, Central Public Health Engineering Research Institute, Nagpur.

It is proposed to study the removal of fluorides and minerals from drinking water by different ion-exchange materials developed indigenously. The ion exchange materials to be studied include sulphonated carbons, cation exchanges prepared from polyvinyl benzene and anion exchange resins prepared by NCL. The factors affecting the removal of fluorides and minerals by these resins will also be studied to develop economic methods for their removal. This problem is of great importance from the point of view of water resources for industry and that of public health.

628.1667

Sewerage

1757.198 Jain, P. K. Estimation of storm sewage in urban areas. I.I.T., Delhi, Civil Engineering, 1966-69. Saranjit Singh, Professor and Subhash Chander, Asstt. Professor.

The hydraulics of unsteady flow in sewer pipes will be used to find out the relationship between the rainfall in the urban areas and the discharge in the sewers. The field data will be compared with the theoretical computations and the effect of storage on peak discharge in the sewers determined.

628.2

Sewage Treatment & Disposal

1758.199 Amin, Pravinbhai Mathurbhai. Studies on certain aspects of sewage purification. Baroda, Biochemistry, 1965-68. Ganapati, S. V., Principal Investigation Officer.

Recent studies have shown that there are many different species of bacteria with the flocculating activity. No detailed study of the predominant bacterial species occuring in oxidation ponds has been made so far. So the types of bacteria present and the biochemical changes brought about in the organic constituents during different stages of purification in the oxidation pond systems are being investigated.

628.354

1759.200 Parhad, Narsing Manikrao Microbiological aspects of oxidation ponds. Nagpur, Central Public Health Engineering Research Institute, Nagpur, 1963-67. Rao, N. U., Asstt. Director, Central Public Health Engineering Research Institute, Nagpur.

Sewage is treated by the oxidation ponds wherein the bacteria get reduced. Preliminary studies on the bacteriological performance of oxidation ponds have been carried out. The possible factors, responsible for the reduction of coliform bacteria, like effect of algae, pH, temperature diurnal variation in the oxidation ponds and survival of pathogenic bacteria, are being studied. The role of bacteriophages and the possibility of the presence of antibiotic substances will also be studied.

Proceedings of a symposium on Water Pollution Control, Nagpur, 28-30th Dec. '65. p. 104-110.

628.3

1760.201 Sridhar, Mynepalli Kameswara Chandra. Studies on enzymes in sewage and sludges. I. I. S., Bangalore, Biochemistry, 1964-68. Pillai, S. C., Asstt. Professor.

A comparative study of catalase in sewage, activated sludge, septic tank sludge, chemically coagulated sludge, Epistylis sp.—Vorticellid protozoan, and associated mixed cultures of bacteria has shown that the protozoan has more activity on equal dry weight basis. The quality of the sludge or its purifying power can be correlated with its catalase activity. Proteolytic activity of activated sludge has shown 3 optimal pH regions with maximum around 7.

(1) Curr. Sci. 34 ; 1965 : p. 602-605 ; and (2) Jour. Sci. Ind. Res. 25(4) ; 1966 : p. 167-171.

628.354

1761.202 Srinath, Embar Gopalan. Studies on some minerals and vitamin B_{12} in sewage and sludges. I. I. S., Bangalore, Biochemistry, 1958-68. Pillai, S. C., Asstt. Professor.

The results of the studies on sewage treatment have indicated that activated sludge process removes most of the minerals and B vitamins and yields an effluent suitable for use in agriculture or industry. The sludge, rich in vitamin B_{12} and proteins, has been found useful as a fish feed and as feed supplement for poultry.

628.354

1762.203 Venkatrao, Baindoor. Studies on the microflora of activated sludge. I. I. S., Bangalore, Fermentation Technology Laboratory, 1964-68. Bhat, J. V., Professor.

The object of the investigation is to isolate, characterize and ascertain the role, if any, of the subdominant flora of sewage and activated sludge. By developing a suitable method, yeasts and bacteria have been isolated and are at present under study. Organisms, active in the degradation of phenol and catechol are also being isolated from sludge adapted to these compounds.

Jour. IIS. 48(1) ; 1966 : p. 20-24.

628.354

Industrial Sanitation

1763.204 Sushil Kumar. Biochemical utilization of indigenous agro-industrial protein wastes. Panjab, Biochemistry, 1966-69. Sareen, K. N., Professor and Head of the Department.

Studies on certain Brassica species are envisaged.

628.54

1764.205 Uppal, J. S. Biochemical utilization of indigenous agro-industrial protein wastes. Panjab, Biochemistry, 1966-69. Sareen, K. N., Professor and Head of the Department.

Studies on certain Brassica species are envisaged.

628.54

Aeronautical Engineering

Aerodynamics

1765.206 Jog, Krishna Vasudeo. Performance analysis and applications of the vortex tube. I. I. T., Bombay, Mechanical Engineering, 1965-68. Parulekar, Bhaskar Balkrishna, Professor.

629.1323

Lift & Thrust

1766.207 Patel, Thakorlal Sukhabhai. Aerodynamic interaction problems. I.I.T., Kharagpur, Aeronautical Engineering, 1966-69. Chaudhuri, S. N., Professor and Head of the Department.

Aerodynamic interaction problems of lift distribution for rotating trailing edge-flaps and lift distribution for fan-in-wing (VTOI) are under study. Theoretical extension and adaptation of existing theory and experimental techniques for measurements are envisaged.

629.13233

Stability & Control

1767.208 Durvasula, Somayajulu. Study of some problems in aeroelasticity and aerothermoelasticity. I. I. S., Bangalore, Aeronautical Engineering, 1963-67. Joga Rao, C. V., Professor.

The vibration, buckling and panel flutter characteristics of thin, parallelogrammic panels which are simply supported and clamped all-round have been investigated. Results are available for different combinations of side ratio, angle of skew etc. The calculation of mode shapes of vibration, inclusion of aerodynamic damping in panel flutter analysis and the influence of in-plane loads on the flutter of clamped panels are three areas currently under investigation.

American Institute of Aeronautics & Astronautics. Fourth Aerospace Sciences Meeting, Los Angeles, 1966. Preprint 66-474.

629.132362

1768.209 Ramakanth Iyengar, N. G. Vibrations of aircraft structural elements under high temperature environments. I. I. T., Kanpur, Aeronautical Engineering, 1966-68. Murthy, P. N., Professor.

It is proposed to study the vibrational characteristics of structural elements in the presence of creep.

629.132362

1769.210 Suryanarayana Sastry, Munukutla. Wings in nonuniform flow. I. I. T., Kharagpur, Aeronautical Engineering, 1966-69. Chaudhuri, S. N., Professor and Head of the Department.

Main stream flows are nonuniform either due to variation in flow properties in space or with time. An attempt is being made to generalize the available cases of shear flow over wing sections.

629.132362

1770.211 Vijayakumar, Kaja. Some problems in buckling and vibration of thin plates. I. I. S., Bangalore, Aeronautical Engineering, 1962-67. Joga Rao, C. V., Professor.

The bounds for poisson's ratios of orthotropic materials have been derived and axially symmetric buckling loads obtained for polar orthotropic annular plates. In energy methods, the influence of admissible functions on estimation of eigenvalues has been studied. Some numerical experiments have been initiated to estimate round-off and truncation errors in approximate estimates of eigenvalues.

629.132362

Boundary Layers

1771.212 Chaudhry, Krishan Kumar. Separation, reattachment and redevelopment of turbulent boundary layers. I. I. T., Delhi, Applied Mechanics, 1965-68. Malhotra, R. C., Assoc. Professor.

A two-dimensional and three-dimensional cavity of variable depth will be placed in a subsonic turbulent boundary layer flow. The basic structure of turbulence within the cavity and in the redeveloping zone downstream of the cavity will be studied, both experimentally and analytically.

629. 13237

1772.213 Sen, Pradeep Kumar. Thermally stratified turbulent boundary layers over a flat plate. I. I. T., Delhi, Applied Mechanics, 1966-69. Malhotra, R. C., Assoc. Professor.

A thermally stratified turbulent boundary layer will be created by artificially heating or cooling the bottom flat pate of a subsonic wind tunnel. The structure of turbulence, the interaction between the temperature and velocity fields, and the transport of mass in the stratified shear flow will be studied, both experimentally and analytically.

629.13237

1773.214 Venkataramana Rao, Gargeswari Nagaraja Rao. Effect of transverse surface curvature on transition and other properties of incompressible boundary layer. I. I. S., Bangalore, Aeronautical Engineering, 1960-67. Dhawan, Satish, Director.

Axial boundary layer stability has been calculated. Experiments on turbulent spots and intermittency during transition on a circular cylinder suggest a critical curvature Reynolds number of 11,000. Axisymmetric law of the wall and theoretical explanation for laminar boundary layer asymmetry have been studied. Noise minimisation in hot wire amplifiers by 'controlled ceiling to floor ratio' is also being attempted.

(1) Jour. Aero. Sci. 28 : p. 248-249 ; and *(2) Jour. Sci. Instr.* 38 : p.491-492.

629.13237

Aircrafts

1774.215 Shivarama Holla, V. Conical cambered wings. I.I.S., Bangalore, Aeronautical Engineering, 1964-67. Krishnaswamy, T. N., Assoc. Professor.

Conical camber distribution for the drag reduction of triangular wings with subsonic leading edges is being studied. Triangular wings with spanwise reflex curvatures have been studied systematically. The optimum wing shapes with minimum drag without suction have been derived. An experimental study of the flow pattern on these cambered wings is in progress.

629.13432

Astronautics

1775.216 Rajappa, Narayana. Investigation in orbital mechanics and related aerospace problems. Madras, National Aeronautical Laboratory, Bangalore, 1962-68. Viswanathan, K. S., Scientist, National Aeronautical Laboratory, Bangalore.

It is proposed to study the orbital mechanics of space vehicles under gravitational and nonconservative forces. Good models of the earth and its atmosphere will be determined from artificial earth satellite data. Optimization techniques with applications to aerospace systems, and interaction of solar plasma with earth's magnetic field will also be studied.

(1) Close equatorial satellites of the moon. (with K. S. Viswanathan). Proc. IAS. 57(4) : April' 63 : p.201-217 ; and (2) Trajectories of close satellites of the moon. ibid. 59(1) ; Jan. '64 : p.49-67.

629.4113

Automatic Control Engineering

1776.217 Desai, Ranjit Chhotubhai. Nonsequential estimation of turbo-alternator transfer functions from normal operating data using calculus of variations. Baroda, Electrical Engineering, 1964-67. Sen, S. M., Professor and Oldenburger, Rufus.

A method has been devised for the estimation of states and parameters of a turbo-alternator from the normal operating data. No assumption is required of noise but the form of the differential equation is assumed apriori. The problem has been solved by treating the least squares problem as the Lagrange problem and solving the resulting TPBV problem, Euler-Lagrange equations, nonsequentially using the steepest gradient method. A method for obtaining the impulse response of a plant from the normal operating data using the gradient method and the DLS principle has also been worked out.

629.8

1777.218 Dubey, Gopal Krishna. Time optimal control systems. I. I. T., Bombay, Electrical Engineering, 1965-68. De, G. C., Asstt. Professor.

The research deals with high order time optimal control systems. At present, there is no scheme which can be useful for industry. An attempt is being made to evolve a modified scheme which will be useful for industry.

629.8

Feedback Systems

1778.219 Bhattacharyya, Asokkumar. Studies on the methods of improving transient response of control system. Calcutta, Radio Physics & Electronics, 1963-67. Chaudhuri, A. K., Professor.

629.8313

1779.220 Biswas, Baidyanath. Studies on automatic phase control circuits. Calcutta, Radio Physics & Electronics, 1962-67. Chakrabarti, N. B., Lecturer.

629.8313

1780.221 Ganti Prasada Rao. Time varying parameter feedback control systems. I. I. T., Kharagpur, Electrical Engineering, 1965-68. Kesavamurthy, N., Professor.

Some useful techniques have been developed for the analysis and synthesis of a class of time varying parameter feedback control systems. A stability criterion for general second order systems with periodic parameters has been developed in a form convenient for programming a digital data processing system. All these techniques are used in making template programmes, very much useful in practical design work. Work on the possibilities of extension of these methods for other classes of time varying systems is in progress.

629.83

1781.222 R. N. P. Singh. Optimal control of systems with distributed parameters. I. I. T., Delhi, Electrical Engineering, 1966-68. Rajamani, V. S., Asstt. Professor.

The research comprises formulation of minimal time-optimal control problems of systems with distributed parameters, solutions by Pontryagin's maximum principle and Bellman's dynamic programming, and approximation of distributed parameter systems with lumped parameter systems.

629.8312

Nonlinear Systems

1782.223 Bhaumik, H. Stability study of nonlinear systems. Roorkee, Electrical Engineering, 1966-68. Ray, L. M., Assoc. Professor.

It is proposed to find out the solution of a nonlinear differential equation from the liapuney function. Once the solution is known, the stability of the system can easily be concluded.

629.836

1783.224 Pradhan, Bimayranjan. Identification of transfer dynamics in adaptive control system. Calcutta, Radio Physics & Electronics, 1962-67. Chaudhuri, A. K., Professor.

629.836

1784.225 Ravish Chandra. Adaptive control systems. Roorkee, Electronics & Communication Engineering, 1964-67. Indiresan, P. V., Professor of Electrical Engineering, I. I. T., Delhi.

Adaptive control systems are capable of adjusting the systems inside so as to optimise with respect to a certain variable. Various indices of performance have been used. The development of superadaptive systems which can switch over optimisation with respect to one I. P. to that with respect to the other seems possible and will be attempted.

629.836

1785.226 Surya Narayana Murthy, Ivatury. Stability of nonlinear control systems. I. I. S., Bangalore, Electrical Engineering, 1965-67. Deekshatulu, Bulusu Lakshmana, Asstt. Professor.

Nonlinear systems exhibit peculiar phenomena, such as, jump, resonance, asynchronous and sub-harmonic oscillations etc. So the question of stability is of fundamental importance especially for such systems. The methods available for the analysis of nonlinear systems are limited and the object of research is, therefore, to develop new methods.

(1) Trans. IEEE. AC-10(1) ; Jan.' 65 : p.90-92 ; and (2) Proc. IEE. (10) ; Oct '64 ; p.1771-1774.

629.836

1786.227 Viswanadham, Nukala. Multivariable control systems. I. I. S., Bangalore, Electrical Engineering, 1966-68. Deekshatulu, Bulusu Lakshmana, Asstt. Professor.

Nonlinear multivariable systems have been designed to meet certain specifications for a range of inputs. Stability and closed loop response of these systems have been analysed by use of describing function technique. Nonlinear sampled data systems have been analysed for both self and forced oscillations by use of descrete describing function. A synthesis procedure has also been developed to determine the compensator for dead beat performance and noninteraction for sampled data multivariable systems, by statespace methods.

629.836

1787.228 Yash Pal Singh. Self and forced oscillations of nonlinear control systems. I. I. T., Kharagpur, Electrical Engineering, 1964-67. Rajagopalan, P. K., Asstt. Professor.

An exact method for the analysis of harmonic and sub-harmonic oscillations in relay control systems has been developed. Analytical techniques using the DIDF for predicting the harmonic and subharmonic oscillations of nonlinear systems have also been investigated.

Proc. IEE. 112(11) ; Nov. '65 : p.2165-2170.

629.836

CHEMICAL ENGINEERING & TECHNOLOGY

1788.1 Naik, Krishna Achuta. Studies in flow reactor. I. I. T., Bombay, Chemical Engineering, 1963-67. Kamath, N. R., Professor and Head of the Department.

The study includes energy loss, heat transfer, kinetics and mass transfer in homogeneous and disperse liquid system flowing in helical coils of different geometry.

660.283

Chemical Processes

1789.2 Santhanam Gopala. Studies in optimum control. I. I. T., Bombay, Chemical Engineering, 1966-68. Venktaraman, Gopala, Assoc. Professor.

660.284

Size Reduction & Separation

1790.3 Ramanujam, M. Studies *in field energy grinding.* I. I. T., Madras, Chemical Engineering, 1964-67. Venkatesawarlu, D., Professor.

The grinding tests are being conducted in a locally fabricated fluid energy mill to study the effect of various factors involved, such as, the air pressure, solid rate feed size, nozzle sizes etc.

660.28422

1791.4 Ramanujam, T. K. Mixing of solids. I. I. T., Madras, Chemical Engineering, 1965-68. Venkateswarlu, D., Professor.

The work is designed to study the mechanism of mixing of solids as well as the effect of various factors, like particle size, shape, density, time of mixing, ratio of the individual components etc., on the degree of mixing. It is also proposed to study the effect of design variables on the degree of mixing.

660.28422

1792.5 Rama Samy, Chinathambi Muthu Samy. Compaction of solids. I. I. T., Madras, Chemical Engineering, 1965-68. Venkateswarlu, D., Professor.

The research comprises determination of porosity-pressure correlation, tensile and compressive strength and its relation with size and pressure applied on the compact, vacuum compacting, temperature contribution on compacting, surface energy relation, and stress distribution. Both organic and inorganic powders will be used as materials for the study.

660.28422

1793.6 Srivastava, Narendra Pratap. Studies on some aspects of classification of solids. I. I. T., Kharagpur, Chemical Engineering, 1965-68. Sen, P., Asstt. Professor.

The separation of particles in a horizontal flow classifier is a slow and inefficient process. By utilizing centrifugal force, the process is likely to be improved. The apparatus, conssting of a rotating tube, designed for this purpose, indicates that good separation can be obtained by this method. The work is in progress.

660.28422

1794.7 Vedaraman, Ramaswamy. Studies in size reduction by vibration mills. I. I. T., Madras, Chemical Engineering, 1964-67. Venkateswarlu, D., Professor.

The performance of the vibration mills is being studied by grinding calcite particles of different sizes and mill charges in an experimental vibration mill using steel balls of different numbers and weights as the grinding media under the specified conditions of mill speed and amplitude of vibration.

660.28422

Mass Transfer

1795.8 Ayyanna, C. Mass transfer from solid to liquid. I. I. S., Bangalore, Chemical Engineering, 1966-68. Kuloor, N. R., Professor and Rajinder Kumar, S., Lecturer.

660.28423

1796.9 Ganguly, Uma Prasad. Simultaneous mass transfer with chemical reaction in a gas-liquid system. I. I. T., Kharagpur, Chemical Engineering, 1965-68. Roy, N. C., Asstt. Professor.

The object of the study is to find the apparent mechanism for the overall reaction of chlorination of acetic acid to monochloroacetic acid. The variables to be studied are flow-rate of gas, height of liquid level, effect of temperature, catalyst and sperger opening.

660.28423

1797.10 Haldar, Bani. Transient rate of absorption in gas-liquid interface. I. I. T., Kharagpur, Engineering, 1964-67. Mitra, Arun Kumar, Asstt. Professor.

The object of the study is to predict interfacial resistance which helps interpreting the interface transfer operation. The transient rate of absorption in laminar jet will be measured. Since mass transfer is influenced by surface velocity and contact xrea of the jet, work is in progress on the hydrodynamics of jet.

660.28423

1798.11 Mohunta, Dev Mohan. Studies in mass transfer. Madras, Chemical Engineering, 1964-68. Laddha, G. S., Director.

The object of this investigation is to study the mechanism of mass transfer in packed liquid-liquid extraction towers. The counter diffusion in partially miscible liquid systems is being investigated for the estimation of individual mass transfer coefficients. It is proposed to correlate individual mass transfer coefficients with the operating and the physical properties of the packing and liquid systems.

660.28424

1799.12 Narasinga Rao, E. V. L. Studies in mass transfer with liquid drop. I. I. S., Bangalore, Chemical Engineering, 1965-68. Kuloor, N. R., Professor and Rajinder Kumar, S., Lecturer

Chem. Engg. Sci. 21 ; 1966 : p. 867-880.

660.28423

1800.13 Narayana Murthy. Studies in liquid-liquid extraction. I.I.T., Bombay, Chemical Engineering, 1965-67. Kamath, N. R., Professor and Head of the Department.

The feasibility of recovering some of the minor constituents of bitterns by the liquid-liquid extraction technique is being studied.

660.28424

1801.14 Ramachandra Iyer, Puthugramam Venkitakrishnan. Implications of the penetration theory of gas absorption. I.I.T., Delhi, Chemical Engineering, 1964-67. Roy, Dilip Kumar, Asstt. Professor.

A generalised penetration theory in the form of $K=f(D_1,D_2,t_c,H)$ has been successfully applied to systems where both liquid and gas phases are known to control the absorption rates. Studies on the evaporation of pure liquids into various gas streams are in progress.

660.28423

1802.15 Ramendra Shanker. Studies on solvent extraction of inorganic substance. Bombay, Atomic Energy Establishment, Trombay, 1964-67. Jagdish Shankar, Head of the Division of Chemistry, Atomic Energy Establishment, Trombay.

Detailed Studies have been made on the solvent extraction behaviour of Ru (III) by primary, secondary and tertiary long chain amines and their mixtures. A few neutral phosphorous and sulphur compounds have been chosen and used as the complexing agents to study the solvent extraction behaviour of technitium and some of the transition elements.

660.28424

1803.16 Srinivasan, K. Studies on liquid extraction. I.I.S., Bangalore, Chemical Engineering, 1962-67. Kuloor, N. R., Professor and Bhat, G. N., Asstt. Professor.

660.28424

1804.17 Takhalate, H.R. Studies on mass and momentum transfer in an ejector. I.I.T., Kharagpur, Chemical Engineering, 1964-67. Roy, A. N., Professor.

Mass and momentum transfer with and without chemical reaction involved in the absorption and desorption processes in gas-liquid systems are being studied employing jets and ejectors. The primary fluid used is air or water while the secondary fluids are solutions of gases, such as, SO_2, NH_3, H_2S etc.

660.28423

Heat Transfer

1805.18 Chockalingam Pillai, Balasubramanya. Heat transfer studies in particle-fluid systems. I.I.T., Bombay, Chemical Engineering, 1965-67. Raja Rao, Manthena, Asstt. Professor.

A packed-fluidized bed is a combination of a stationary packed bed and a fluidized bed. The heat transfer in such a system is governed by the physical and thermal properties of both the stationary packing and the fluidizing material. The object of the investigation is to evaluate the heat transfer characteristics of such a system.

660.28427

1806.19 De, Dhiren Sankar. Study of heat transfer from direct flame to a moving bed of granular solids in a rotating shaft. I.I.T., Kharagpur, Chemical Engineering, 1964-67. Mukherjee, Satya Gopal, Assoc. Professor of Mechanical Engineering.

The object of the research is to study some of the design parameters of an oil fired rotary kiln. The effect of feed size, feed rate and residence time on the heat transfer coefficient and the degree of decomposition of the solid is being studied for the purpose.

660.28427

1807.20 Kalayanasundaram, C. V. Heat transfer in dispersed particles. I.I.S., Bangalore, Chemical Engineering, 1963-67. Kuloor, N. R., Professor and Rajinder Kumar, S., Lecturer.

Proceedings of the CSIR Symposium on Chemical Process Design, 1963. p.32-35.

660.28427

1808.21 Mahajan, S. P. Heat and mass transfer studies. I.I.T., Bombay, Chemical Engineering, 1965-69. Narasimhamurty, G. S. R., Professor.

Studies are being made of the bubble behaviour in Newtonian and non-Newtonian liquids. More stress will be laid on the velocity of the bubble, shape of the bubble, and mass transfer to and from the liquid under investigation. The behaviour of single bubble gives an insight into several operations, like two-phase flow, gas absorption, boiling and floatation.

660.28427

1809.22 Narayanaswamy, V. Heat transfer to two-phase flow in packed beds and annulai. Osmania, Chemical Technology, 1963-67. Kaparthi, Ramalingam, Professor.

Studies on heat transfer to liquids and gases flowing through annular cross section, packed beds and annular packed beds have been conducted to calculate wall coefficients. The experimental data is being processed for a mathematical model.

Studies on heat transfer to liquids in packed beds. Ind. Jour. Tech. 2(6) ; 1964 : p. 181-185.

660.28427

1810.23 Pullaiah, Samedani. Heat transfer to boiling liquids. Osmania, Chemical Technology, 1966-70. Kaparthi, Ramalingam, Professor.

The effect of the non-Newtonian behaviour of the fluids on the boiling heat tranfer has been investigated. Experiments are being planned to find out the effect of the sonic and ultrasonic vibrations on the boiling heat transfer.

660.28427

1811.24 Rajasekharan, S. Studies in momentum and heat trasfer to non-Newtonian fluids in coiled pipes. I. I. S., Bangalore, Chemical Technology, 1962-67. Kuloor, N. R., Professor and Kubair, Venugopala, Lecturer.

Ind. Jour. Tech. 4(2) ; 1966 : p.33-35.

660.28427

1812.25 Ramamurthy, K. Heat transfer studies in fluidized beds. I. I. T., Madras, Chemical Engineering, 1965-67. Subbaraju, K., Lecturer.

A study of heat transfer in an annulus from an internally heated tube to batch fluidized beds of various materials and sizes fluidized by water and water-glycerol mixture and then to an externally cooled tube has been undertaken. An attempt will also be made to establish a generalized correlation comprising the effect of number of variables.

660.28427

Momentum Transfer

1813.26 Basu, Anjali. Mass transfer from multiple liquid drops in stagnant and moving liquid columns. I. I. T., Kharagpur, Chemical Engineering, 1964-67. Roy, Nirmal Kanti, Asstt. Professor.

The momentum transfer studies with multiple liquid drops and mass transfer with single drops in stagnant liquid columns already completed in the laboratory are being extended to correlate mass transfer with multiple liquid drops in stagnant/moving liquid columns for better designs of liquid-liquid spray extraction columns.

660.284292

1814.27 Bhat, Ananda P. Mass and momentum transfer in two-phase systems. I. I. T., Kharagpur, Chemical Engineering, 1965-68. Roy, A. N., Professor.

The mass and momentum transfer are being studied employing two-phase and three-phase systems in an ejector. Correlations are also being developed to predict the mass ratio of the entrained fluid to the motive fluid in the light of Reynolds number, the geometry of ejector and the physical properties of solid-fluid systems.

660.284292

1815.28 Chatterjee, Asok. Studies on spouting. I. I. T., Bombay, Chemical Engineering, 1965-67. Kamath, N. R., Professor and Head of the Department.

660.284292

1816.29 Kasthuri, K. Studies in fluid mechanics. Madras, Chemical Engineering, 1965-68. Laddha, G. S., Director.

The investigation is concerned with flow of fluids through annular packed beds. The role of packing size and shape of packing as well as the effect of radii of the annulus will also be evaluated with reference to pressure drop in such beds.

660.284292

1817.30 Pritchard, Colin L. Mass transfer from falling drops. I. I. T., Delhi, Chemical Engineering, 1964-67. Sehgal, P. N., Asstt. Professor.

An experimental technique has been developed for measuring the rate of evaporation from falling drops. Results have been compared with the predictions of boundary layer and penetration theories of mass transfer. The effect of surface impurities on the rate of evaporation and the evaporation of sprays are also under study.

A. I. Ch. E. Jour. 8 ; 1966 : p.93-101.

660.284292

1818.31 Sawarkar, Sachhidanand Krishnaji. Momentum transfer in multi-phase fluid flow systems. I. I. T., Kharagpur, Chemical Engineering, 1964-67. Roy, Nirmal Kanti, Asstt. Professor.

Experimental studies on momentum transfer aspects of simultaneous gas-liquid fluidization of solids are in progress. The effect of introductory gas in solid-liquid fluidization on minimum fluidization velocity, bed expansion and other parameters, and the minimum power consumption in hydro-pneumatic conveyance of solids is being studied.

660.284292

1819.32 Subramanian, N. Studies on particle motion in batch fluidization. I. I. T., Madras, Chemical Engineering, 1963-67. Gopichand, T., Asstt. Professor.

A model has been postulated for the particle velocity distribution in fluid beds. It is being tested with determination of particle concentrations with height and time at various velocities.

660.284292

1820.33 Vedaiyan, S. Hydrodynamics of two-phase flow in spray columns. Madras, Chemical Engineering, 1965-68. Laddha, G. S., Director.

The investigation is concerned with hydrodynamics of two-phase flow in spray columns with reference to limiting velocities of continuous and dispersed phase flow rates and hold up of the dispersed phase under various operating conditions.

660.284292

1821.34 Vyarawalla, Farouq. Momentum and mass transfer studies in two-phase and three-phase systems. I. I. T., Kharagpur, Chemical Engineering, 1965-68. Guha, Dilip Kumar, Asstt. Professor.

The investigation is being carried out on two interrelated aspects of momentum and mass transfer in a spray column. The first part involves studies on spray dynamics with liquid and suspensions, while the second is concerned with studies on absorption with chemical reaction in a three-phase system.

660.284292

Crystallization

1822.35 Surinder Parkash. Studies in industrial crystallization. I. I. T., Delhi, Chemical Engineering, 1964-67. Lele, P. S, Asstt. Professor.

The study deals with the measurement of growth rates of crystals from their aqueous solutions in fluidized bed and correlation of the growth rate data in terms of transport properties. A pilot plant study and operation of rocking crystallizer will also be undertaken.

660.284298

Alkylation, Acylation & Aromatization

1823.36 Ramachandra Murty, Kavirayani. Synthesis of some organic compounds using some inorganic catalysts at high pressure. I. I. T., Kharagpur, Applied Chemistry, 1966-68. Palit, S. K., Asstt. Professor.

The work has been undertaken to synthesize chemicals of industrial importance from cheap raw materials, such as, chlorobenzene, carbon monoxide, benzene etc. The syntheses are being carried out under pressure both in the presence of self and external catalysts.

660.28441

1824.37 Sarma, G. Subbaraya. Dealkylation of aromatic hydrocarbons. I. I. S., Bangalore, Chemical Engineering, 1966-68. Kuloor, N. R., Professor.

660.28441

1825.38 Sharma, Deoki Nandan. Acid catalysed alkylations and acylations of aromatic rings. I. I. T., Kharagpur, Applied Chemistry, 1965-68. Bhattacharyya, Naba Kumar, Asstt. Professor.

The alkylation of aromatic rings with various esters and alcohols has been studied in the presence of polyphosphoric acid under suitable experimental conditions to furnish the expected alkylated aromatic compounds. The utilization of the method to give an easy synthetic route for medicinally important compounds is in progress.

660.28441

Halogenation

1826.39 Desai, N. R. A study of chlorination reaction. I. I. S., Bangalore, Chemical Engineering, 1966-69. Kuloor, N. R., Professor and Viswanath, D. S., Asstt. Professor.

660.284423

1827.40 Basu, Asokkumar. Studies in conjugated and solvent hydrogenation of fats. Calcutta, Applied Chemistry, 1965-69. Chakravarti, M. K., Reader.

660.28443

1828.41 Bhattacharya, Debaprasad. Liquid phase autocatalytic oxidation of aromatic hydrocarbons. I. I. T., Kharagpur, Chemical Engineering, 1965-68. Roy, A. N., Professor.

The autocatalytic oxidation of alkylaromatics, including picolines, has been studied in liquid phase with air or oxygen using cobalt-bromine salts as catalysts in a semicontinuous stainless steel reactor. High yields of carboxylic acids have been obtained. Studies are in progress to determine the mechanisms and kinetics of the reactions.

660.28443

1829.42 Chatterjee, Samir Kumar. Studies on abnormal β-elimination and acid catalysed cyclisation. I. I. T., Kharagpur, Applied Chemistry, 1965-68. Bhattacharyya, Naba Kumar, Asstt. Professor.

The dehydrohalogenation of some β-haloketones in the presence of suitable acids and bases has been studied and possible mechanism suggested. The acid catalysed cyclisation leading to suitably substituted hydrindenes and hydrindanes is under study.

660.28443

1830.43 Gurumurthy, C. V. Studies in the oxidation of propionaldehyde. I. I. S., Bangalore, Chemical Engineering, 1966-69. Govindarao, V. M. H., Lecturer.

660.28443

1831.44 Iftikhar Ahmed, S. The oxidation of aromatic hydrocarbons. I. I. S., Bangalore, Chemical Engineering, 1966-69. Kuloor, N. R., Professor and Ibrahim, S. H., Asstt. Professor.

660.28443

1832.45 Nagaraj, K. Oxidation of alkyl benzene. I. I. S., Bangalore, Chemical Engineering, 1966-69. Kuloor, N. R., Professor.

660.28443

1833.46 Pant, Gopinath Sidhanth. Studies in oxo-synthesis. I. I. S., Bangalore, Chemical Engineering, 1964-67. Ghosh, S. S., Assoc. Professor.

660.28443

1834.47 Poornam, A. R. Sundara Pari. Catalytic vapour phase oxidation of hydrocarbon in fixed and fluidized bed. I. I. T., Kharagpur, Applied Chemistry, 1964-67.

Bhattacharya, S. K., Professor and Head of the Department.

The catalytic vapour phase oxidation of toluene to benzaldehyde has been studied in fixed and fluidized bed. The fused vanadium and molybdenum mixed oxides on silica carrier have been found to be the best catalysts. The comparative efficiency of various catalysts and the kinetics of the reaction are under investigation.

660.28443

1835.48 Ramasubramanian, V. Oxidation of picolines in liquid phase under pressure by air. I. I. T., Kharagpur, Applied Chemistry, 1966-68. Bhattacharyya, S. K., Professor and Head of the Department.

The vapour phase aerial oxidation of picolines has been done and it is found that it can also be carried out in liquid phase with the use of smaller amounts of catalysts. Investigations on the latter are in progress.

660.28443

1836.49 Rao, U. R. Studies in dehydrogenation reactions. I. I. S., Bangalore, Chemical Engineering, 1965-67. Kuloor, N. R., Professor and Rajinder Kumar, S., Lecturer.

660.28443

1837.50 Sampath Kumar, R. Hydrogenation of aromatics. I. I. S., Bangalore, Chemical Engineering, 1964-67. Kuloor N. R., Professor and Bhat, G. N., Asstt. Professor.

660.28443

1838.51 Thakur, D.S. Simultaneous dehydrogenation of alcohols and reduction of nitrobenzene, I. I. S., Bangalore, Chemical Engineering, 1966-68. Deshpande, P. K., Lecturer.

660.28443

Sulphonation

1839.52 Bandyopadhyay, Anil Chandra. Studies on synthetic and natural sulphides with special attention to the recovery of sulfur. I. I. T., Kharagpur, Applied Chemistry, 1966-69. Ganguly, N. D., Asstt. Professor.

The study deals with the kinetics of the oxidation of pyrites, process development for the elimination of sulfur in the elemental state from natural sulphides, and correlation of the structure and activity of synthetic and natural sulphides.

660.28447

Applied Physical Chemistry

1840.53 Chaudhuri Satiprasad. Some studies on spelling of aluminosilicate refractions. Calcutta. Applied Chemistry, 1964-67. Chatterjee, M. K., Lecturer.

660.29414

1841.54 Madhavan, Krishnan Pozhath. Automatic control of concentration of multicomponent liquid systems. I. I. T., Bombay, Chemical Engineering, 1962-67. Venkataraman, Gopala, Assoc. Professor.

To aid the investigation an automatic concentration recording instrument has been designed, constructed and tested. An extensive study of the characteristics of high frequency inductive type of measuring cell has been made and a quantitative relationship proposed for the response of this cell.

660.2943

1842.55 Ramakrishnan, S. Studies in bubble formation. I. I. S., Bangalore, Chemical Engineering, 1965-68. Kuloor, N. R., Professor and Rajinder Kumar, S., Lecturer.

660.29453

1843.56 Satyanarayana. Studies in bubble formation. I. I. S., Bangalore, Chemical Engineering, 1966-68. Kuloor, N. R., Professor and Rajinder Kumar, S., Lecturer.

660.29453

1844.57 Srikrishna, Mudunuri. Motion of liquid drops in gases. I.I.T., Bombay, Chemical Engineering, 1963-67. Narasimhamurty, G. S. R., Professor.

The present investigation includes the determination of frequencies of oscillation, terminal velocities and evaporation rates from drops of liquid suspended in a current of air. The sizes of drops and the physical properties of drop liquids have been varied.

660.294515

1845.58 Varaprasad, Singaraju Siva Rama Krishna. Two-phase flow in conduits. I. I. T., Bombay, Chemical Engineering, 1963-67. Narasimhamurty, G. S. R., Professor.

The flows of gas-liquid system in horizontal pipe, with and without turbulence promoters, have been studied. The major variables are : liquid Viscosity= 0.76cp. to 450.3 cp., Pitch of turbulence promoter =75mm, 100 mm and 150 mm. A glass holdup column has been designed for measuring the inplace phase volumes of gas and liquid in the pipe. Correlations have also been attempted.

660.294515

Phase Changes

1846.59 Krishnamurthy, P. G. Studies in three-phased reactions. I.I.S., Bangalore, Chemical Engineering, 1962-67. Kuloor,

N. R., Professor and Rajinder Kumar, S., Lecturer.

Ind. Jour. Tech. 2(2) ; 1964 : p. 68-69.

660.2963

1847.60 Kulandaivelu, V. Physico-chemical studies relating to methanol conversion. I. I. S., Bangalore, Chemical Engineering, 1965-68. Kuloor, N. R., Professor and Ibrahim, S. H., Asstt. Professor.

660.2963

1848.61 Mitra, Sovamay. Studies on the phase transformation of silica. Calcutta, Applied Chemistry, 1964-67. Lahiri, D., Reader.

660.2963

1849.62 Raphael Pillai, T. J. Studies in catalytic·vapour phase reaction. I.I.S., Bangalore, Chemical Engineering, 1966-69. Kuloor, N. R., Professor and Rajinder Kumar, S., Lecturer.

660.2963

Thermodynamics

1850.63 Gurukul, S. M. K. A. Thermodynamics of vapour-liquid equilibria of non-ideal systems. I. I. T., Kharagpur, Chemical Engineering, 1966-68. Raju, B. N., Lecturer.

The equilibrium data for few binary and ternary systems have been obtained, tested and correlated. New equations are being developed for the prediction of vapour pressures of pure components, and binary and ternary azeotropes.

Jour. Chem. Engg. Data. 11 ; 1966 : p. 501.

660.2969

1851.64 Pachaiyappan, V. The correlation of thermodynamic and transport properties of solids, liquids and gases. I.I.S., Bangalore, Chemical Engineering, 1962-67. Kuloor, N. R., Professor and Ibrahim, S.H., Asstt. Professor.

(1) Jour. Chem. Engg. Data. 11(1) ; 1966 : p. 73-76 ; and (2) *Chem. Engg. 74 ; Feb. 13, '67 : p. 140.*

660.2969

1852.65 Raju, K. S. N. Thermodynamics of vapour-liquid equilibria of non-ideal systems. I.I.T., Kharagpur, Chemical Engineering, 1963-68. Rao, M. N., Professor and Head of the Department.

The equilibrium data for few binary and ternary systems have been obtained experimentally. The data will be tested and correlated.

660.2969.

1853.66 Ranganathan, R. Evaluation of excess thermodynamic properties. I. I. T., Kharagpur, Chemical Engineering, 1962-68. Rao, M. N., Professor and Head of the Department.

A calorimeter for the determination of heats of mixing has been designed, fabricated and erected. The heats of mixing data for a few binary and ternary systems have been obtained and the pertinent literature has been reviewed. The data will be tested and correlated. Coupled with vapour-liquid equilibrium data, the rest of the excess properties of the systems in question will also be evaluated.

660.2969

1854.67 Seshadri, D. N. Studies in the computation and application of thermodynamic properties. I.I.S., Bangalore, Chemical Engineering, 1962-67. Kuloor, N. R., Professor and Viswanath, D. S., Asstt. Professor.

(1) Jour. IIS. 48(1) ; 1966 : p. 40-51 ; and (2) ibid. 48 (2&3) ; 1966 : p. 65-79.

660.2969

Electrochemistry

1855.68 Agarwal, Ram Kripal. Physico-chemical studies in the solvents of high dielectric constant. I.I.T., Kharagpur, Applied Chemistry, 1965-67. Nayak, B., Asstt. Professor.

The thermodynamic properties of hydrochloric acid solutions in formamide have been studied at several temperatures ranging from 25°C. to 55°C. Similar studies are in progress in respect of hydrobromic acid in the same solvent.

Jour. Phys. Chem. 70 ; 1966 : p. 2568.

660.2977

1856.69 Mital, Chandra Kant. Kinetics of electrodissolution and electrodeposition of metals. I.I.T., Bombay, Chemical Engineering, 1962-68. Hira Lal, Professor.

It is proposed to study the corrosion of metals under conditions of laminar flow, and the corrosion of zinc in acidic and neutral solutions, particularly ammonium salts.

660.297

1857.70 Sadananda Rao, Bangra Kulur. Studies in chlor-alkali cells. I.I.T., Bombay, Chemical Engineering, 1966-70. Kamath, N.R., Professor and Head of the Department.

It is proposed to study the simultaneous evolution of oxygen and chlorine under various conditions, and the flow of mercury and its effect on hydrogen evolution at the cathode.

660.29724

1858.71 Chaudhuri, Arun Kumar. Fluidization. I.I.T., Kharagpur, Chemical Engineering, 1965-68. Sen Gupta, P., Asstt. Professor and Roy, N.C., Asstt. Professor.

The research has been undertaken to elucidate the kinetics of vapour phase partial oxidation of ethanol to acetaldehyde over silver catalyst. The study is being carried out in an integral flow reactor. The change in the activity of the catalyst with time has already been studied.

660.2995

1859.72 Das, Chandra Kumar. Kinetic studies of hydration of acrylic acid and its esters in liquid phase under high pressure. I.I.T., Kharagpur, Applied Chemistry, 1966-68. Bhattacharyya, S.K., Professor and Head of the Department.

The investigation on the kinetics of the reversible liquid phase addition reactions under high pressure (3000 atmosphere) has been undertaken to elucidate their mechanisms from the view point of the activation volume. The reactions which will be studied are : Acid catalysed hydration of acrylic acid, and Acid catalysed hydration of acrylic esters. Studies of activation parameters give an idea about the nature of transition state which helps bring to light the mechanism of the reaction as a whole.

660.2993

1860-73 Ghose, Jayasree. Physico-chemical studies of $Sn(VO_3)_4$ and $AgVO_3$. I.I.T., Kharagpur, Applied Chemistry, 1965-68. Bhattacharyya, S.K., Professor and Head of the Department.

The catalysts, $Sn(VO_3)_4$ and $AgVO_3$ have been prepared and their surface areas measured, evacuating at different temperatures. Conductivities have also been measured at different temperatures and different gas pressures. The chemisorption of O_2 and H_2 on the catalysts is being studied. The catalysts have also been subjected to D. T. A.

660.2995

1861.74 Karanth, Panambur Krishna. Kinetic studies on urea-adduct formation in batch systems. I. I. T., Kharagpur, Chemical Engineering, 1963-67. Rao, M. N., Professor and Head of the Department.

The object of the research is to investigate the kinetics of urea-dewaxing of NHK lubricating oil fraction and evaluate the rate controlling mechanism. The effects of variables, such as, particle size of urea, concentration of reactants and activator on rate constants will also be studied.

660.299

1862.75 Kulkarni, Arun Bhaurao. Non-catalytic reactions in reacting pores. I. I. T., Kanpur, Chemical Engineering, 1965-67. Narsimhan, G., Professor and Head of the Department.

A mathematical model has been proposed for the determination of the profile of a reacting cylindrical pore. For the experimental verification of the theory, oxidation of hollow graphite cylinders and dissolution of hollow benzoic acid cylinders have been undertaken. Both fast and slow rates have been expedited.

660.299

1863.76 Mahanti, Pratima. Influence of starting materials, preparatory methods and promoters on the physico-chemical properties and catalytic activity of vanadium pentoxide. I. I. T., Kharagpur, Applied Chemistry, 1964-67. Bhattacharyya, S. K., Professor and Head of the Department.

V_2O_5 catalyst has been prepared by different methods using MoO_3, cobalt oxide promoters and kieselguh support. The decomposition of starting material into V_2O_5 has been studied through DTA and chemical analysis. The surface areas of the catalysts have been measured by BET methods. A study of the kinetics of oxygen chemisorption on the catalyst surfaces is in progress.

660.2995

1864.77 Pahari, Sudhansu Sekhar. Study on physico-chemical properties of catalysts. I. I. T., Kharagpur, Applied Chemistry, 1965-68. Bhattacharayya, S. K., Professor and Head of the Department.

Silver oxide is the catalyst chosen for study. D. T. A. studies and surface area measurements have been made. The chemisorption of oxygen and hydrogen at different temperatures has also been carried out. The magnetic and conductivity measurements are in progress.

660.2995

1865.78 Sadangi, Krishna Chandra. Physico-chemical studies in porous catalysts. I. I. S., Bangalore, Chemical Engineering, 1964-67. Kuloor, N. R., Professor and Ibrahim, S. H., Asstt. Professor.

660.2995

1866.79 Subramanian, Ramaswamy. Kinetics of liquid phase reactions. I. I. T., Madras, Chemical Engineering, 1964-67. Bhimeswara Rao, P., Asstt. Professor.

Studies are being done on the kinetics of esterification of acids with alcohols using ion exchange resins as catalyst.

660.299

Industrial Microbiology

1867.80 Rudra Setty, Tholalu Maribasappa Setty. Bacterial synthesis of amino acids. I. I. S., Bangalore, Fermentation Technology Laboratory. 1965-69. Bhat, J. V., Professor.

The possibility of industrial production of amino acids by microorganisms has been recently shown by Kinoshita and others in Japan. The screening programme with the above objective has helped obtaining a few promising bacterial cultures for the production of lysine, glutamic acid, and threonine. Further work is in progress.

660.6

Heavy Chemicals

Inorganic Chemicals

1868.81 Basu, Sarajit. Regeneration of soda chemicals from alkaline black liquor through a simplified process. I. I. T., Bombay, Chemical Engineering, 1963-67. Independently.

Soda chemicals' regeneration from black liquor has been undertaken by lignin precipitation followed by causticization of the filtrate of the carbonated black liquor. The process variables have been studied during carbonation by CO_2 gas, causticization and sedimentation, for different types of black liquor i.e. sulfate or soda using bamboo, bagasse and rice straw as cellulosic raw materials. Optimum data have also been obtained for designing the different units.

661.32

1869.82 Mitra, Asit Kumar. Utilization of Amjhore pyrites. I. I. T., Kharagpur, Chemical Engineering, 1963-67. Nandi, S. K., Professor.

Pyrites available at Amjhore contain 40-42% sulphur. In the present investigation, the extraction of elemental sulphur is being studied. By thermal decomposition in inert atmosphere, 50% sulphur is liberated within 10 minutes at 715°C. About 60% yield of elemental sulphur is obtained by reacting pyrites with superheated steam in fluidized bed at 500°C.

Studies on fluidization of pyrites, fluidization and related processes: A Symposium, Publication & Information Directorate, New Delhi, 1965. p.110-116.

661.1

1870.83 Ramana Rao, Dochibhotla Venkata. Flotation studies of inorganic minerals. I. I. T., Madras, Chemical Engineering, 1965-67. Hohmann, Ing. Emil H., Professor.

A study of basic and applied problems on flotation of inorganic minerals, like potash, sulphur and other minerals important to India has been undertaken.

661.3

1871.84 Vyas, Siddheshwar Nath. Phase studies in aqueous oceanic salt systems. I. I. T., Bombay, Chemical Engineering, 1962-67. Venkataraman, R., Asstt. Professor.

The work has been undertaken to study the behaviour of sea brines or similar salt lake brines. Such phase diagrams indicate the possibility of partial or complete recovery of such marine chemicals from sea water. The present work mainly deals with isotherms of different systems.

661.3

Organic Chemicals

1872.85 Balwar, A. K. Physico-chemical problems relating to the plant for the manufacture of acetic anhydride from acetone. I. I. S., Bangalore, Chemical Engineering, 1965-68. Deshpande, P. K., Lecturer.

661.864

1873.86 Jandial, Onkar Nath. Studies in the chlorination of butadiene and oxidation of dichlorobutenes. I. I. T., Bombay, Chemical Engineering, 1964-67. Kamath, N. R., Professor and Head of the Department.

Butadiene has been chlorinated in the gas phase to obtain essentially 1, 2 dichlorobutene-3 and 1, 4 dichlorobutene-2. The isomeric dichlorobutenes have been isolated by fractional distillation. The dichlorobutenes have also been epoxidized with preformed peracetic acid. It is proposed to study the condensation of epoxidichlorobutenes with α, ω-dihydroxy compounds and in particular 4, 4-dihydroxy diphenyl propane-2 and evaluate the properties of the products so obtained.

661.814

1874.87 Panchal, B. H. Substitution in phenolic compounds. Bombay, Chemical Technology, 1962-67. Khorana, M. L., Professor of Pharmaceutical Chemistry.

The glycosides of different phenolic compounds used in medicine are being prepared with a view to study their pharmacological activity.

661.826

1875.88 Suryanarayana Murthy, K. Dehydration of alcohols. I.I.S., Bangalore, Chemical Engineering, 1966-69. Kuloor, N. R., Professor and Ibrahim, S. H., Asstt. Professor.

661.82

1876.89 Tripathy, Narayan. Utilization of chlorobenzene for the production of various chemicals. I. I. T., Kharagpur, Applied Chemistry, 1964-67. Bhattacharyya, S. K., Professor and Head of the Department.

Work has been undertaken to synthesise chemicals of industrial importance from cheap raw materials, such as, chlorobenzene, carbon monoxide, water etc. The syntheses are being carried out under pressure, both in the presence and absence of catalysts.

661.8916

1877.90 Trivedi, Mahendra Kumar. Studies on lignin isolated from agricultural residues. I. I. T., Bombay, Chemical Engineering, 1963-67. Kamath, N. R., Professor and Head of the Department.

Lignin from bagasse, rice straw and wheat straw has been isolated by various methods, characterised by various physical properties and compared.

661.802

Fuel Technology

1878.91 Bandyopadhyay, Asimkumar. Studies in oxidation of coal with reference to its constitution. Calcutta, Applied Chemistry, 1961-68. Lahiri, A., Director, Central Fuel Research Station, Dhanbad.

662.62

1879.92 Bandyopadhyay, Sudhirchandra. Spontaneous combustion of coal. Calcutta, Applied Chemistry, 1962-67. Chakrabarti, R. N.

662-62

Food Technology

Sugars & Sugar Products

1880.93 Brahme, Prabhakar Heramb. A process study of the hydrogenation of glucose to sorbitol. Bombay, National Chemical Laboratory, Poona, 1963-67. Narasimhan, G., Scientist, National Chemical Laboratory, Poona.

The liquid phase reduction of D-glucose to D-sorbitol with suspended Raney nickel catalyst has been studied. An empirical equation relating the initial reaction rate to the important process variables is being derived.

664.1

1881.94 Madhavapeddi, Murali Krishana. Studies on guava jelly. I. A. R. I., Delhi, Horticulture, 1964-67. Jain, N. L., Principal Scientific Officer, Defence Science Laboratory, Delhi.

The technological studies on guava jelly are being carried out for the fixation of maturity standards for harvest of fruit and standardisation of conditions for preparation, packaging and storage of normal as well as low solid jellies, including an investigation into non-enzymatic browning during preparation and storage.

664.152

Fats & Oils

1882.95 Kaimal, T. N. Balagopala. Studies on natural and hydrogenated fats. Kerala, Applied Chemistry, 1964-68. Lakshminarayana, G., Scientist, Regional Research Laboratory, Hyderabad.

Periodate-permanganate oxidation studies on unsaturated glycerides and esters are being carried out. The occurrence and distribution of unusual fatty acids in plant tissues have been investigated. Acyl migration and structural changes during hydrogenation of glycerides are being examined. Methods for detection of adulteration of fats will be developed.

664.3

1883.96 Mani, V. V. S. Studies on fatty acids and their esters. Kerala, Applied Chemistry, 1963-67. Achaya, K. T., Scientist, Regional Research Laboratory, Hyderabad and Lakshminarayana, G., Scientist, Regional Research Laboratory, Hyderabad.

Methods have been developed for the detection of adulteration of vegetable oils with castor oil and mineral oils, and of coconut oil with other vegetable oils. Various fatty acid mono- and diesters of ethylene glycol have been synthesized. These are being used in studies on pancreatic lipase specificity.

(1) Ind. Jour. Tech. 2(9) : p. 320 (2) ibid. 2(12) : p.416 ; and (3) ibid. 3(10) : p.339-340.

664.3

1884.97 Venkatesan, N. Studies on seed proteins. Bombay, Chemical Technology, 1962-67. Rege, D. V., Professor of Food Technology.

Studies relating to chemical, nutritional and technological aspects of seed proteins of the inedible oil seeds, such as, Bassia latifolia, Actino daphne hookeri and Calophyllum inophyllum, are in progress.

664.3

Industrial Oils, Fats & Gases

Refining

1885.98 Chatterjee, Manojit Kumar. Studies on fluidization for bleaching. Jadavpur, Chemical Engineering, 1966-69. Mukherjee, R. N., Professor.

An attempt is being made to study the application of fluidization technique in the bleaching of vegetable oils and fats as well as mineral oils.

665.0283

1886.99 Chatterjee, Sarojit Kumar. Studies on foam separation. Jadavpur, Chemical Engineering, 1966-69. Mukherjee, R. N., Professor.

It is proposed to study the application of foam separation technique in the refining and bleaching of fats and oils.

665.0283

Vegetable Fats & Oils

1887.100 Kallyanpur, Mohan Rao. Studies in fat-splitting. Bombay, Chemical Technology, 1964-77. Kane, J. G., Professor of Oil Technology.

Castor oil and hydrogenated castor oil have been split by the Twitchell method as well as under pressure and study has been made of the extent of estolides formation during the progress of reaction. The distribution of the catalyst between aqueous and fatty phases is also being studied.

665.353

1888.101 Vaidya, Shrikant Dattatray. Preparation and study of Twitchell type catalysts. Bombay, Chemical Technology, 1964-67. Kane, J. G., Professor of Oil Technology.

Normal alkylbenzenes of even numbered alkyl chains from hexyl- to octadecyl- have been synthesized. The route of synthesis consists of preparation of acid chloride, Friedel-Craft's ketonic condensation with benzene and Wolff-Kishner reduction to alkylbenzene. The sulphonic acid of the alkylbenzenes have been employed as fat-splitting catalysts at 1.25% concentration for splitting refined groundnut oil.

665.3

Petroleum

1889.102 Bhaskara Rao, B. K. Chemical Engineering aspects of phenol extraction of aromatics from lubricating oils. I. I. T., Kharagpur, Chemical Engineering, 1964-67. Rao, M. N., Professor and Head of the Department.

The viscosity index of lubricating oils can be improved by extracting aromatics using a suitable solvent, such as, phenol. The present work consists of studies on extraction at elevated temperatures and temperature gradients along the column.

665.538

1890.103 Chopra, Sawaran Jit. Separation of cyclohexane from straight run fractions of Indian crudes. I. I. T., Delhi, Chemical Engineering, 1966-69. Mukhopadhyay, P. K., Asstt. Professor.

Cyclohexane, raw material for petrochemical industry, is manufactured from naphtha by platforming to form benzene, solvent extraction and distillation for purifying and its subsequent hydrogenation. The object of the study is to develop separation methods for the production of high purity cyclohexane from straight run naphthas which contain fair amount of cyclohexane.

665.5382

1891.104 Dwivedi, M. C. Diffusion studies in hydrocarbon systems. I. I. T., Bombay, Chemical Engineering, 1965-68. Independently.

Studies are being conducted on solvent extraction and urea dewaxing of the diesel oil fraction of Ankaleshwar crude oil to obtain a high quality and low pour winter diesel fuel.

665.5384

1892.105 Mohan Rao, Neelapu Ananda. Kinetic studies on adsorption treatment of heavy petroleum fractions in unsteady state systems. I. I. T., Kharagpur, Chemical Engineering, 1962-67. Rao, M. N., Professor and Head of the Department.

A dewaxed lubrication oil fraction from Assam crude oil has been subjected to treatment with activated bauxite in batch and semi-flow systems, and the rates of removal of resins have been measured. From the data, the rate-controlling mechanism is being determined and theoretical equation derived.

665.5385

Sulphur Dioxide

1893.106 Biswas, Asok Kumar. Some technical reactions of sulfur dioxide with carbonaceous material. I. I. T., Kharagpur, Chemical Engineering, 1964-67. Roy, N. C., Asstt. Professor.

Studies are being made to investigate the possibility of recovering sulfur and carbon disulfide from roastur gases by reacting with some carbonaceous materials, e.g. coke, with and without catalysts, the reaction being carried out in the temperature range of 750°C–1100°C in an integral flow reactor.

665.85

Ceramic & Allied Industries

Glass

1894.107 Betaraya, T. R. Fabrication and properties of certain electro-ceramic products in the system $BaO-TiO_2-P_2O_5$. Osmania, Chemical Technology, 1963-67. Abde Ali, Professor and Head of the Department.

It is proposed to study the dielectric properties of products in binary systems $BaO-P_2O_5$, $TiO_2-P_2O_5$ and $BaO-TiO_2$ as well as the effect of Al_2O_3 addition on them. The dielectric behaviour of glass, glass-cerams and ceramics in the ternary system $BaO-P_2O_5-TiO_2$ and the effect of Al_2O_3 additions on them will also be studied. The results will be explained in terms of solid-state physics and crystal chemistry and an attempt made to find out the possibility of probing into the theory of structure of glasses and glass-cerams.

666.1

1895.108 Tiwary, Rameshwary Prasad. Structure and properties of phosphate glasses. Ravishankar, Chemistry, 1963-67. Thakur, R. L., Scientist, Central Glass and Ceramics Research Institute, Jadavpur.

The glass formation in quaternary systems involving P_2O_5 has been studied. The properties studied are chemical durability, density, refraction, softening points, thermal expansion and transmission. These are being interpreted in terms of possible structures.

666.13

Masonry Adhesives

1896.109 Goswami, Giridhari. Some investigations in super sulphated cement. Calcutta, Applied Chemistry, 1963-67. Lahiri, D., Reader.

666.9

Paints & Dyes

1897.110 Karanjgaokar, Chandrashekhar Gopal. Naturally occurring 2,2-dimethyl chromenes. Bombay, National Chemical Laboratory, Poona, 1963-67. Venkataraman, K., Director (Retd.), National Chemical Laboratory, Poona.

Four new pigments have been isolated from Garcinia morella. The structures of two of them, morellic and isomorellic acids, have been determined, and those of the other two are under investigation. The structures of several degradation products of morellin have also been elucidated. The structure of a new pigment isolated from Garcinia xanthochymus is being examined.

667.2

1898.111 Shirsalkar, Madhusudan Madhao. Some studies of anticorrosive paints with special reference to ship's bottom paints. Bombay, Regional Research Laboratory, Hyderabad, 1965-68. Aggarwal, J. S., Deputy Director, Regional Research Laboratory, Hyderabad.

Studies have been carried out on development of anticorrosive paints for ship's bottom on the basis of modification of alkyl resins with CNSL resins and styrenated resins with promising results. Coal-tar pitch CNSL resin combinations have proved to be excellent media for ship's bottom paints in laboratory trials. The use of phosphates of heavy metals and a new organic pigment to replace imported pigments in the anticorrosive paints is under investigation.

667.6

1899.112 Shiva Mohan Singh. Physico-chemical studies of paints for tropics. Roorkee, Chemistry, 1964-67. Malik, Wahiduddin, Professor and Head of the Department and George, Joseph, Scientist, Central Building Research Institute, Roorkee.

The effect of extenders and metallic soap on drying shrinkage and colour fadation of cement paint films has been studied. An investigation on the suitability of indigenous instumescent agents for fire retardent coating has been carried out. The adhesion of paint films on porous substrates is under investigation.

(1) Paintindia. 12(8) ; 1962 : p. 19 ; (2) ibid. 13(4) ; 1963 : p. 30 ; (3) ibid. 15(1) ; 1965 : p. 1929 ; (4) ibid. 19(11) ; 1966 ; (5) Jour. Col. Soc. 2(2) ; 1963 : p. 13 ; and (6) Ind. Builder. 14(2) ; 1966 : p. 188.

667.6

Synthetic Compounds

Surface-Active Materials

1900.113 Gupta, Ashim. *Studies on fatty acid monoglycerines and their sulfonates.* Jadavpur, Chemical Engineering, 1965-68. Mukherjee, R. N., Professor.

It is intended to evolve a new type of anionic surface-active preparation. Comparative properties are being studied against commonly available detergents, with individual saturated and unsaturated fatty acids, so as to prepare a cheap detergent from inedible oils and indigenous raw materials.

668.14

1901.114 Jain, Ajay Kumar. *The use of electrometric, spectrometric and radiotracer techniques in the study of surfactants and heavy metal soaps.* Roorkee, Chemistry, 1964-67. Malik, Wahid-uddin, Professor and Head of the Department.

Detailed studies are being carried out on the suitability of metal, metal soap electrodes in determining the critical micelle concentration of potassium soaps and composition of heavy metal soaps. The effect of foreign additives on the c. m. c. of surfactants has been studied. A quantitative study on the interaction between cationic surfactants and anionic dyes, and measurement of the solubility of cobalt soap by radiotracer technique will also be taken up.

668.125

1902.115 Saraswathy Amma, P. K. Preparation and evaluation of detergent products based on vegetable oils. Kerala, Applied Chemistry, 1960-66. Achaya, K. T., Scientist, Regional Research Laboratory, Hyderabad.

Alkyl aryl products in which the alkyl chain is derived from fats have been sulphonated and the products evaluated as surfactants. Amine N-oxides with odd-carbon chains have been similarly evaluated. Various diol sulphates are being examined as surface-active agents.

668.14

Adhesives & Glycerin

1903.116 Garikipati Sastry, Devaki. Studies in natural resins : Constitution of lac. I. I. T., Bombay, Chemical Engineering, 1962-67. Kamath. N. R., Professor and Head of the Department.

Lac as also the methyl ester of lac have been fractionated to give about fifteen fractions using selective solvents, low temperature crystallization and adsorption-elution techniques. Individual fractions have been characterised by their component acids. A new acid not reported so far has been obtained in the yield of 9% on lac and characterised as 4-hydroxy lauric acid.

668.372

1904.117 Padmanabhan, M. R. A study of the methods for the determination of the glyceride composition of fats. Bombay, Chemical Technology, 1959-68. Rebello, D., Professor.

The oxidation of binary mixtures of synthetic saturated-unsaturated glycerides has confirmed that hydrolysis of oxidised glycerides affects the computation of results. Work on the crystallization of fats and lipase hydrolysis is in progress.

668.2

Plastics

1905.118 Bandyopadhyay, Tapan Kumar. Study on graft copolymerization based on shellac and vegetable oil. Jadavpur, Chemical Engineering, 1966-68. Mukherjee, R. N., Professor.

Shellac is being replaced by synthetic resins in many traditional fields. The object of the study is to develop graft polymers of shellac with styrene, acrylonitrile etc., to extend the present use of shellac in new fields.

668.45

1906.119 Deshpande, Ashok Madav. Studies in polymerization of vinyl acetate. Bombay, Chemical Technology, 1963-67. Potnis, S. P., Professor of High Polymer Technology.

The work deals with the study of the polymerization of vinyl acetate in glacial acetic acid. It has been confirmed that the polymerization does take place in glacial acetic acid medium. The rate constants and other kinetic data are being studied by the method of dialatometry.

668.4236

1907.120 Gupta, Satyendranath. Studies on vinyl polymerization with aro-amidines and other initiators. Calcutta, Applied Chemistry, 1965-69. Nandi, U. S., Reader, Indian Association for the Cultivation of Science, Calcutta.

668.4236

1908.121 Kasat, R.B. Absorption of formaldehyde by cellulose in presence of swelling agents. Bombay, Chemical Technology, 1962-68. Nabar, G. M., Director.

668.44

1909.122 Kelkar, Vasant Mahadev. Studies on corrosion protection offered by processed manganese to steel in sea water. Bombay, Chemical Technology, 1963-67. Puntambekar, Shripati Venkatesh, Professor of High Polymer Technology (Retd.).

Finely divided manganese powder with different organic binder media viz., chlorinated rubber, polystyrene has been used for the first time in paints and their dry film properties on mild steel substrate have been studied. It has been established that around 70% of the pigment volume concentrates on the dry film bases. All the essential conditions for paints that can offer cathodic protection to the steel substrate in sea water are fulfilled. Manganese rich paints have been observed to protect steel in more than one mode of action.

668.4233

1910.123 Mandal, Brajamohan. Kinetics and end group studies in the polymerization of styrene. Calcutta, Applied Chemistry, 1963-67. Nandi, U. S., Reader, Indian Association for the Cultivation of Science, Calcuta.

668.4233

1911.124 Rachuram, P. V. T. Studies on kinetic and chain transfer in venyl polymerization. Calcutta, Applied Chemistry, 1963-68. Nandi, U.S., Reader, Indian Association for the Cultivation of Science, Calcutta.

668.4236

1912.125 Ray, Pradipkumar. Studies on lateral order in cellulose fibre by X-ray diffraction method. Calcutta, Applied Chemistry, 1964-68. Banerjee, S. B.

668.44

1913.126 Sidhanty, Ashok Ramchandra. Studies on celluloses isolated from agricultural residues. I.I.T., Bombay, Chemical Engineering, 1964-67. Kamath, N. R., Professor and Head of the Department.

The analysis of various cellulosic raw materials, namely, bamboo, rice straw and bagasse has been carried out and a modified method for the estimation of lignin developed. Cellulose, cellosans and hemicelluloses have been isolated and are now under investigation.

668.44

Fertilizers

1914.127 Narayana Rao, V. Granulation of fertilizers. I.I.T., Madras, Chemical Engineering, 1965-67. Hohmann, Ing. Emil H., Professor.

Granulation of superphosphate and some of the mixed fertilizers in a rotary granulator has been taken up. It is proposed to investigate the best process variable conditions, and arrive at the best binders and anticaking agents to yield good granules to suit the Indian soils and climatic conditions.

668.625

Metallurgy

Electrometallurgy

1915.128 Dhananjayan, Nayar. Studies on the structure of electrodeposited manganese. Madras, Physics, 1964-67. Banerjee, Tarapada, Scientist, National Metallurgical Laboratory, Jamshedpur.

The nature and growth of electrodeposits of manganese from solutions of manganese and ammonium sulphate, with or without addition agents, have been studied and a mechanism has been proposed involving the deposition of manganese in metastable F.C.T. gamma or complex cubic alpha modifications under different experimental conditions.

669.0284

1916.129 Venkatachalam, Subramanian. Studies on solid-fluid interfaces : Beneficiation and electrorefining studies on sulphides. I.I.T., Bombay, Metallurgical Engineering, 1965-67. Mallikarjunan, Ramachandran, Assoc. Professor.

The work is being done on the use of indigenous materials to be used as reagents in the flotation process for the beneficiation of sulphides. It also includes the preparation of metals directly by the electrolysis of the sulphides.

669.0284

Extractive Metallurgy

1917.130 Ahmed Sherif. Abnormality and gram size control of steel. Calcutta, Engineering, 1966-68. Nijhawan, B. R., Director, Institute of Metallurgy, Jamshedpur.

669.142

1918.131 Banerjee, Shilobhadra. Studies on graphitization and spheroidization of graphite in cast iron. I.I.T., Bombay, Metallurgical Engineering, 1963-67. n.g.

The uncleation of spheroidal graphite in cast iron has been critically reviewed and investigated by the isothermal, resistometric and dilatometric studies of the graphitization reaction in untreated and magnesium treated irons.

669.1413

1919.132 Hinif Khalaf. Substitute resistant and stainless steel. Calcutta, Engineering, 1966-68. Nijhawan, B. R., Director, Institute of Metallurgy, Jamshedpur.

669.142

1920.133 Kataria, B. M. Production of iron powder by reduction of mill scale. I.I.T., Kharagpur, Metallurgical Engineering, 1965-68. Das, M. R., Asstt. Professor.

Investigations have been taken up to achieve bulk production of the commercial grade of iron powder by reducing iron mill scale. Iron powders produced in a chamber type batch furnace have been found to be comparable with good grade of imported sponge iron powders. The characteristics of the powder are under study.

669.1419

1921.134 Sarkar, Satyabrata. Metallurgy of the process of dressing and sulphur treatment of gold bullion. Calcutta, Engineering, 1965-67. Das, P. P.

669.22

Metallurgical Furnaces

1922.135 Agrawal, K. C. Kinetics and mechanism of dephosphorisation in open hearth furnaces. I.I.T., Kharagpur, Metallurgical Engineering, 1966-69. Sen, P. K., Assoc. Professor.

The effects of diffusion of phosphorus in the bath, surplus oxygen concentration, temperature, and nature of slag on the kinetics of dephosphorisation are being studied. The rate controlling steps will be determined and the mechanism suggested.

669.84

1923.136 Lahiri, Arun Kumar. Thermo-chemical treatment of blast furnace process. I. I. T., Kanpur, Metallurgical Engineering, 1964-67. Sheshadri, Varadrajan, Asstt. Professor.

669.8

1924.137 Sandhir, R. K. Heat transfer in open hearth furnaces. I. I. T., Kharagpur, Metallurgical Engineering, 1965-68. Sen, P. K., Assoc. Professor.

Fuel requirement depends on the emissivities of flame and slag. It is proposed to determine the effects of chemical composition and physical properties of the slag on its emissivity. The heat requirement of the bath will be correlated to the slag and flame emissivities.

669.84

Physical Metallurgy

1925.138 Bhagwati Prasad. Physical metallurgy : Measurement of stacking fault energy of metals and alloys. Banaras, Metallurgy, 1966-67. Anantharaman, T. R., Professor and Head of the Department.

It is intended to determine the stacking fault energy (S.F.E.) of hexagonal solid solutions and intermetallic compounds by X-ray line-broadening analysis. If possible, the S.F.E. will also be determind by transmission electron microscopy as well as by the incremental creep method so that a reliable estimate of the S.F.E. can be made.

669.94

1926.139 Bose, S. K. Kinetics of formation of oxides, sulphides and halides on silver in thin film range. I.I.T., Kharagpur, Metallurgical Engineering, 1966-69. Sircar, S. C., Asstt. Professor.

It is proposed to study the kinetics of thin film formation on silver at low temperature under the atmospheres of oxygen, hydrogen sulphide and halogens. The influence of electric field on the kinetics of film formation will also be studied. Electrometric method has been employed for determination of film thickness.

669.94

1927.140 Ghosh, D. N. Decarburization in Fe-C melts. I.I.T., Kharagpur, Metallurgical Engineering, 1965-68. Sen, P. K., Assoc. Professor.

The kinetics and mechanism of decarbonization of Fe-C melt are not very well-known in the low carbon ranges. The effect of factors, like temperature, degree of stirring, carbon concentration and surplus oxygen on the rate of decarbonization is being studied in laboratory melts. Activation energy and the nature and role of the rate controlling step are being determined.

669.94

1928.141 Krishna Kant Prasad. Thermodynamic properties of metallic oxide and alloy systems. I.I.S., Bangalore, Metallurgy, 1966-69. Abraham, K. P., Asstt. Professor.

It is proposed to study the thermodynamic properties of metallic systems and metal oxide systems by solution calorimetry and electromotive force measurements using solid electrolytes. The enthalpy data and the activity data pertaining to these systems will be collected by these two techniques.

669.94

1929.142 Krishnamurthy, P. K. Kinetics of oxidation of copper in thin film range. I.I.T., Kharagpur, Metallurgical Engineering, 1965-67. Sircar, S. C., Asstt. Professor.

An attempt is being made to explain quantitatively the mechanism of growth of thin oxide films on copper on the basis of the effects of plastic deformation and subsequent annealing, temperature, oxygen pressure, applied external field of both polarities, alloying etc., on the kinetics.

669.94

1930.143 Nagarajan, K. V. Study of eutectoid and martensite type of transformations in ferrous alloys. I.I.T., Madras, Metallurgy, 1964-67. Ramachandran, E. G., Professor.

The aim of the investigation is to study the effects on these transformations of prior constituents, mechanical working and nature, amount and pressure of occluded gas using the standard techniques of physical metallurgy.

669.94

1931.144 Tiwari, Gyanendra Prasad. Diffusion studies in metals of nuclear interest and their low binary alloys. Banaras, Metallurgy, 1965-69. Anantharaman, T. R., Professor and Head of the Department.

The investigations relate to diffusion of insoluble tracers in fcc metals and alloys, and anomalous diffusion behaviour of bcc transition metals and alloys. It is proposed to establish that (i) insoluble tracers diffuse through dislocations because of low lattice diffusivity rather than due to their extremely poor solubility, and (ii) the anomaly of diffusion in bcc transition metals is due to temperature dependence of the diffusion parameter. A change in the mode of diffusion is not involved.

(1) Acta Met. 15 ; 1967 : p.157 ; and (2) ibid. 15 ; 1967 : p.654.

669.94

Metallography

1932.145 Krishna Rao, P. Physico-chemical studies in iron and steel making. I.I.T., Bombay, Metallurgical Engineering, 1965-68. Djiakonov, A. I., Professor and Roy, D. L., Assoc. Professor.

It is proposed to study the carbon oxidation reaction in steel making and its kinetics under different conditions.

669.95142

1933.146 Ramachandra Rao, Patcha. Study of some binary alloy systems by the Duvez liquid quenching technique. Banaras, Metallurgy, 1965-67. Anantharaman, T. R., Professor and Head of the Department.

When drops of molten metals or alloys are ejected by a shock wave onto a highly conducting substrata, they cool at a rapid rate of 10^6-10^7 deg. C/sec. This leads to the formation of new intermediate phases, amorphous phases and to an extension of solid solubility in alloys. The alloys of lead-antimony and aluminium-silver quenched from the liquid state are under investigation with the help of standard techniques, like optical and electron microscopy and X-ray diffraction.

669.95

1934.147 Sen, Saurindrakumar. Properties of metals and alloys at low temperature. Calcutta, Chemistry, 1962-67. Srivastava, B. N., Ceramic Research Institute, Calcutta.

669.95

1935.148 Venkataraman, Ganapathy. Phase transformation in steels. I.I.T., Bombay, Metallurgical Engineering, 1965-68. Mallik, Ajit Kumar, Assoc. Professor and Head of the Department.

The investigation aims at studying the changes in structure and improvement in mechanical properties in Cr-Ni-Mo steels as a result of ausforging. It is proposed to correlate the observed changes with the help of electron microscopy, diffraction and other physical methods.

669.95142

MANUFACTURES

Metal Products

Foundry Practice

1936.1 Joshi, Markandeya Das. Solidification of castings. I. I. T., Kharagpur, Mechanical Engineering, 1966-68. Chandiramani, K. G., Professor.

It is proposed to investigate the thermal history of simple shaped castings by the lumped node technique on analog and digital computers. The results will be correlated with experimental work involving thermo-couple and pour-out techniques.

671.25

Mechanical Working & Forming

1937.2 Chaturvedi, Ramesh Chandra. Analysis and investigation of deformation and resistance to deformation in cross forging and cross rolling process. I. I. T., Bombay, Mechanical Engineering, 1962-67. Independently.

671.32

1938.3 Ghosh, Ranjit Kumar. Application of the theory of plasticity to metal forming processes. Calcutta, Engineering, 1964-67. Bhattacharyya, Amitabha, Professor of Mechanical Engineering, Jadavpur University.

671.3

1939.4 Pujara, K. K. Some aspects of controls on rolling mills. I. I. T., Delhi, Mechanical Engineering, 1965-69. Moore, N. P. W., Visiting Professor and Head of the Department.

Thickness of the rolled strip is sought to be controlled in the new type of rolling mill called the Pendulum Mill.

671.32

Joining & Cutting

1940.5 Das, Srinibas. Some aspects of basic mechanics of metal cutting. Calcutta, Engineering, 1963-67. Bhattacharyya, Amitabha, Professor of Mechanical Engineering, Jadavpur University.

671.53

Nonmetal Products

Pulp

1941.6 Negi, J. S. Study of the constitution of hemicelluloses from bamboo, Dendrocalamus strictus. Agra, Forest Research Institute, Dehra Dun, 1965-68. Guha, S. R. D., Officer-in-Charge, Cellulose and Paper Branch, Forest Research Institute, Dehra Dun.

The hemicellulose in fractions will be extracted from chlorite holocellulose, which after purification will be studied for its sugar components by chromatographic technique. The degree of polymerization, nature and point of branching will be studied by molecular weight determination, methylation studies and periodate consumption.

676.14

Textiles

1942.7 Chakravarti, Sushilkumar. Structure and mechanical properties of jute yarns. Calcutta, Applied Chemistry, 1964-67. Mukherjee, R. R.

677.13

1943.8 Jai Prakash. A study of some aspects of tensile mechanical properties in relation to structural behaviour of textile fibres, fibre assemblies and yarn with special reference to cotton. Bombay, Central Cotton Technological Research Laboratory, Bombay, 1958-67. Iyengar R. L. N., Director (Retd.), Central Cotton Technological Research Laboratory, Bombay.

The effect of different types of testing machines and relative humidity on bundle strength has been determined. Strength tests have also been carried out at different gauge lengths to investigate the dependence of strength gradient on structural imperfections. Experiments are being performed to determine the minimum twist of cohesion of rovings and its dependence on fibre properties.

677.217

1944.9 Panday, Shri Nath. Studies on raw and chemically modified cotton. Bombay, Central Cotton Technological Research Laboratory, Bombay, 1963-67. Iyengar, R. L. N., Director (Retd.), Central Cotton Technological Research Laboratory, Bombay.

The object of the investigation is to obtain information concerning the changes in physical, chemical and structural properties brought about by chemically modifying raw cotton. The interrelationships between the

properties will also be studied. Raw cotton has been chemically modified with amines and aqueous solutions of alkalies under varying conditions in slack state.
677.213

Elastomers

1945.10 Basu, Dipakkumar. Studies on vulcanisation of rubber. Calcutta, Applied Chemistry, 1963-67. Sarkar, Anilkumar, Reader, Indian Association for the Cultivation of Science, Calcutta.
678.24

1946.11 Chakrabarti, Sibanath. Studies on vulcanisation of rubber. Calcutta, Applied Chemistry, 1963-67. Sarkar, Anilkumar, Reader, Indian Association for the Cultivation of Science, Calcutta.
678.24

1947.12 Poali, Amalendu. Studies on vulcanisation of rubber. Calcutta, Applied Chemistry, 1963-67. Sarkar, Anilkumar, Reader, Indian Association for the Cultivation of Science, Calcutta.
678.24

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